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OCEANIA

A JOURNAL DEVOTED TO THE STUDY OF THE NATIVE PEOPLES OF AUSTRALIA, NEW GUINEA AND THE ISLANDS OF THE PACIFIC OCEAN

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CONTENTS

HOUSE BUILDING AMONG THE MAE ENGA, WESTERN HIGHLANDS, TERRITORY OF NEW GUINEA. *M. J. Meggitt* .. ..*page* 161

FRIENDSHIP IN TANGU. *Kenelm O. L. Burridge* .. .. .. „ 177

RACE RELATIONS ON THE NORTH COAST OF NEW SOUTH WALES. *Malcolm J. C. Calley* .. .. „ 190

THE BLOOD GROUPS OF A FURTHER SERIES OF AUSTRALIAN ABORIGINES. *Olga Kooptzoff and R. J. Walsh* .. .. .. „ 210

THE BLOOD GROUPS OF SOME NATIVE INHABITANTS OF THE TONGAN ISLANDS. *Olga Kooptzoff and R. J. Walsh* .. .. „ 214

METRICAL CHARACTERS OF A CENTRAL AUSTRALIAN TRIBE. *A. A. Abbie* .. .. „ 220

REVIEWS—

C. E. Fox. *A Dictionary of the Nggela Language (Florida, British Solomon Islands)* .. .. „ 244

H. G. Barnett. *Anthropology in Administration* .. .. .. „ 245

Paul S. Lietz (Ed.). *Calendar of Philippine Documents in the Ayer Collection of the Newberry Library* .. .. „ 247

F. S. Bodenheimer. *Insects as Human Food* .. .. „ 247

NOTES AND NEWS .. .. „ 248

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OCEANIA

A JOURNAL DEVOTED TO THE STUDY OF THE NATIVE PEOPLES OF AUSTRALIA, NEW GUINEA, AND THE ISLANDS OF THE PACIFIC

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HOUSE BUILDING AMONG THE MAE ENGA, WESTERN HIGHLANDS, TERRITORY OF NEW GUINEA

By M. J. MEGGITT

THE Mae occupy the valleys of the Ambum, upper Lai and the upper Lagaip Rivers in the Wabag administrative sub-district. For a brief account of Mae society, see my " Enga Political Organization," to be published in *Mankind* (Sydney, 1957). Population density is from about 120 to 150 per square mile. Their houses and sweet potato gardens are situated at altitudes ranging from about 6,000 to 8,000 feet above sea-level. Summer temperatures fall as low as 60° F., and rarely exceed 75° F., while winter temperatures are often below 45° F. Above 7,000 feet, heavy winter frosts are usual. The annual rainfall varies from about 90 to 110 inches, most of which falls between September and March. Mae obviously need well-constructed houses to cope with these conditions.

They state that they normally replace their houses every three to four years (calculated in terms of wet seasons), and that most house building occurs in the drier winter months. Observation confirms these statements. Thatch of houses more than three years old is overgrown with weeds, and is no longer rain- and wind-proof. The houses stink, and are flea-ridden.

When in October, 1955, I made my first census of houses belonging to Kara clan at Sari, near Wabag, there were nineteen men's houses and forty-five women's houses. No house building occurred during the wet summer months ; but when the rains eased early in 1956, building began.

These were all replacements ; no additional houses were built, because no Kara clansmen acquired new wives during that year.

The following account deals simply with the mechanics of Mae house building. The social categories of people involved and their reciprocal social obligations will be discussed elsewhere.

Mae men and women live in separate houses, which differ in their internal arrangements and dimensions (see Diagrams 1 and 2). Women's houses contain inner

rooms and pig-stalls; men's do not. Women's houses vary comparatively little in their overall dimensions; men's houses vary markedly, ranging from one-occupant structures to sub-lineage houses accommodating eight to ten men and their sons. Even the latter, however, rarely attain the size of the average woman's house, because

TABLE I.
Building Rates.

Weather.	Month.	Houses Replaced.		Total.
		Men's.	Women's.	
Wet	October, 1955–January, 1956.	0	0	0
Wet	February.	1	0	1
Rain easing ..	March.	2	1	3
Fairly dry ..	April.	0	3	3
Dry	May.	0	2	2
Dry	June.	0	3	3
Dry	July.	2	2	4
Rain starting ..	August.	0	1	1
Wet	September.	0	0	0
Total replaced ..	.. .. ..	5	12	17
Total houses ..	.. .. ..	19	45	64
Percentage replaced	.. .. ..	26	26	26

no provision need be made for pig-stalls. Nevertheless, despite these differences both sorts conform to a single basic style, and the initial stages in building both are the same.

TABLE II.
Building Schedule.

Day.	Men's House.	Women's House.	Men Employed.
First	Prepare the site.		1 to 5
Second	Construct the outer walls.		3 to 6
Third	Construct the roof.		3 to 6
Fourth	Thatching (10 to 20 men)	Inner rooms and pigstalls.	3 to 6
Fifth	—	Thatching.	10 to 20

Mae theory is that construction of a men's house should take four days, of a woman's house five days. Unexpected rain may upset this schedule, but most house building I saw adhered closely to it.

Timber for the house is cut several weeks in advance, and is split and stacked to dry in the sun. Stone axes (not adzes) were used in the past; now steel axes

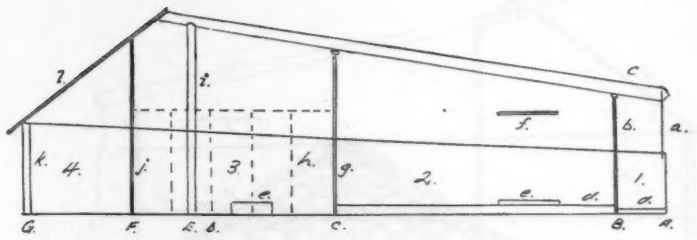


Diagram IA: Mae Woman's House (side elevation).

a. Porch rafter.
b. Gable wall.
c. Ridge-pole.
d. Plank.
e. Stone fireplace.
f. Fire baffle.
g. Inner wall.
h. Pig-stall.
i. Rear main post.
j. Cubicle wall.
k. Rear wall.
l. Rear rafter.
1. Porch.
2. Living room.
3. Pig-stall room.
4. Sleeping cubicle.

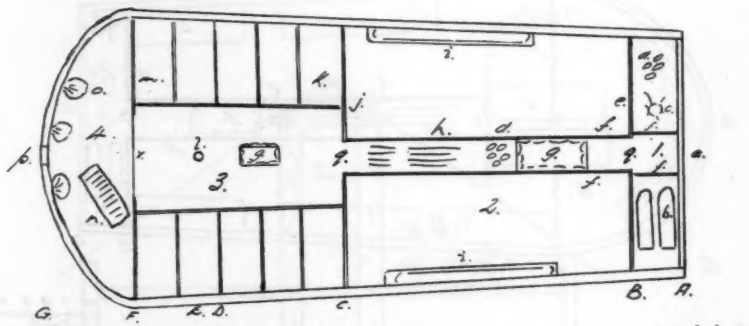


Diagram IB: Mae Woman's House (plan).

a. Porch sill.
b. Door planks.
c. Oven place.
d. Oven stones.
e. Gable wall.
f. Plank.
g. Stone fireplace.
h. Firewood.
i. Storage trough.
j. Inner wall.
k. Pig-stall.
l. Main post.
m. Cubicle wall.
n. Sleeping mat.
o. Net bag.
p. Emergency exit.
q. Doorway.
r. Stile.

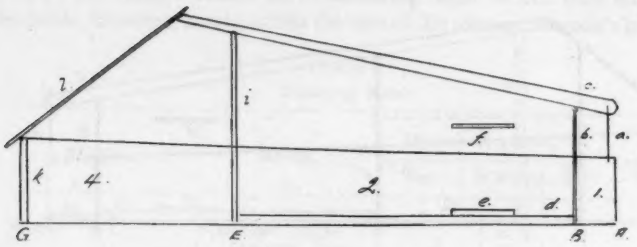


Diagram IIA: Mae Men's House (side elevation)

a. Porch rafter.
b. Gable wall.
c. Ridge-pole.
d. Plank.
e. Stone fireplace.
f. Fire baffle.
i. Main post and partition.
k. Rear wall.
l. Rear rafter.
1. Porch.
2. Living room.
3. Sleeping/storage cubicle.

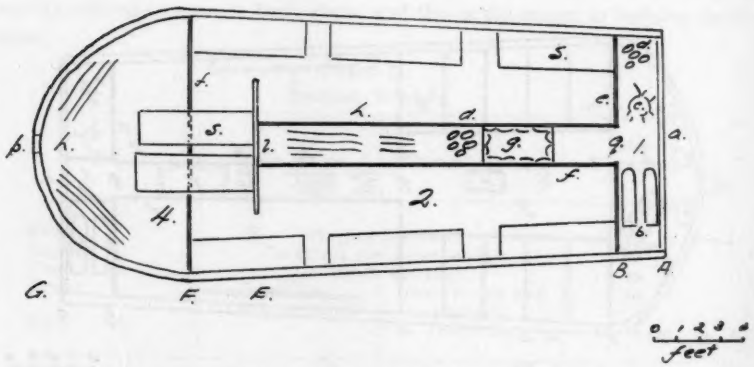


Diagram IIB: Mae Men's House (plan)

a. Porch sill.
b. Door planks.
c. Oven place.
d. Oven stones.
e. Gable wall.
f. Plank.
g. Stone fireplace.
h. Firewood.
l. Main post and partition.
p. Emergency exit.
q. Doorway.
s. Bed.
1. Porch.
2. Living room.
3. Sleeping/storage cubicle.

0 1 2 3 4
feet

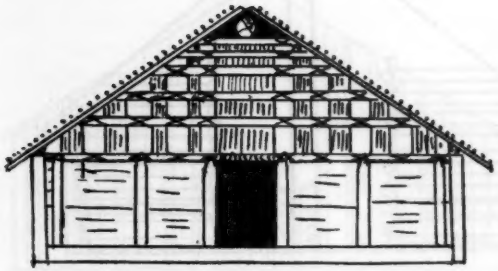


Diagram IIIA: FRONT ELEVATION
(section A towards B of I and II)

0 1 2 3 4
feet

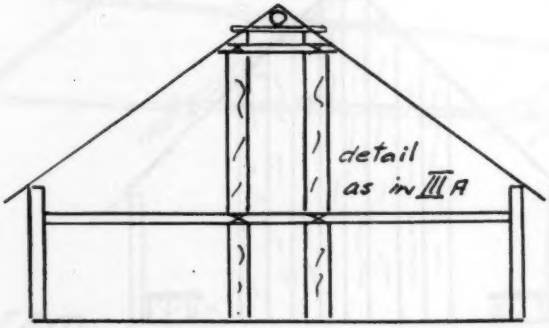


Diagram IIIB: FRONT ELEVATION
(section across C of I)

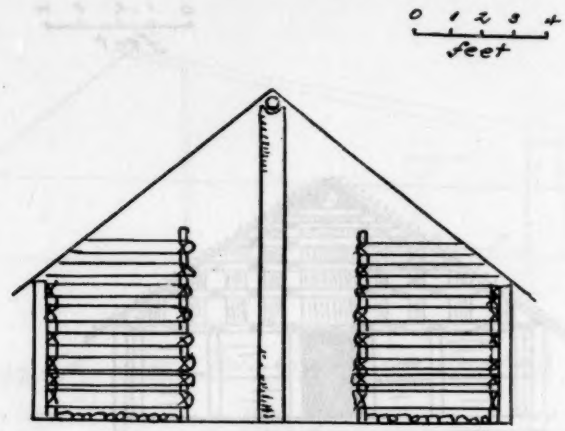


Diagram III C: FRONT ELEVATION
(section D towards E of I)

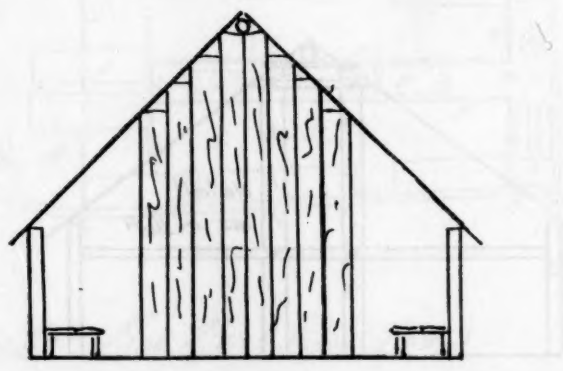
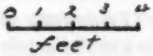


Diagram III D: FRONT ELEVATION
(section across E of II)



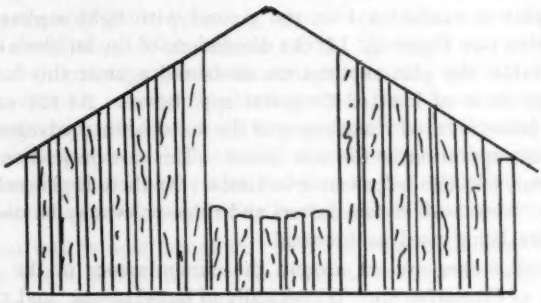


Diagram III E: FRONT ELEVATION
(section across F of I)

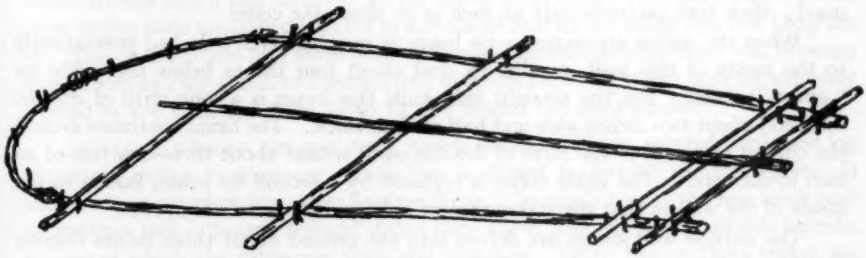


Diagram IV:
GROUND PLAN OF WOMAN'S HOUSE,
MARKED OUT WITH SAPLINGS.

are used. A few days before building starts a variety of tough bush vines and strips of pliable bark (*Triumfetta* sp. ?) are collected and coiled ready for use as lashing. The house site is usually selected on a hill-side or ridge-top for reasons of defence and privacy. The ground is cleared of undergrowth and carefully levelled with paddle-shaped digging sticks or, nowadays, steel spades. If the site is cut into a hill-side, the banks are neatly squared and trimmed.

The house plan is marked out on the ground with light saplings and withes pegged into position (see Figure 4). If the dimensions of the builder's current house have proved suitable, the plan saplings are measured against this house by using measuring strings made of knotted *Cordyline* spp. leaves. At the same time the builder's current house is razed ; and many of the materials are salvaged and stacked neatly to await incorporation in the new house. This not only saves the builders considerable labour, but also helps conserve timber, for there is generally a shortage of suitable trees. Some wall stakes, rafters and ridge-poles may be used in three or four houses before being used as firewood.

The inner wall stakes are set around the circumference of the ground plan. These are usually of *Casuarina* spp., occasionally of laurel or oak, and are from 45 to 60 inches long, five inches wide and about one inch thick, pointed at one end. The pointed end is rammed into the ground and a gap of about six inches is left between the stakes. A double collar beam of bamboo or withes is lashed with vine to the upper ends of the stakes. It is about 36 inches above the ground at the front (porch) end of the wall, and about 51 inches at the rear (curved) end. This serves as a guide when the stakes are hammered home with a heavy (about 20 pounds) *Casuarina* maul ; their tops protrude only an inch or so above the collar.

When the stakes are secure, a tie beam or nogging piece is lashed permanently to the inside of this wall, parallel to, and about four inches below the guide (or " ghost ") collar. For the straight side walls this beam is a long strip of dressed softwood about two inches wide and half an inch thick. The beam continues around the curved rear wall in the form of flexible, split withes about three-quarters of an inch in diameter. The guide collar is replaced by a second tie beam, lashed to the inside of the wall so that the stakes project only an inch or two above it.

The outside wall stakes are driven into the ground about three inches outside the line of inner stakes and opposite the gaps between them, i.e., so that the inner stakes are also opposite the six-inch gaps between the outer stakes. The space between the two walls is filled with an insulation of *Miscanthus* sp. canegrass, the stems and leaves of which are rammed down parallel to the ground. When this insulation almost reaches the top of the stakes, more stakes are hammered into the ground to fill the six-inch gaps left between the pairs of inner wall stakes. A space equal to two inner stakes (i.e. about 12 inches) is left at the rear end of the house to form an emergency exit in case of fire or attack. The tough insulation, however, covers this gap, so that escapees are likely to be incinerated while trying to cut through it. The space between the end (porch) stakes of both inner and outer walls is faced with a stake driven in at right angles to them.

Dry *Pandanus* spp. palm leaves (each about 48 inches by four inches) are used to face the external wall. They are slid parallel to the ground between the external wall stakes and the tightly packed insulation, and overlap slightly to make the facing rain-proof. At the same time strong vine is lashed to the top of the end (porch) stake of the outer wall. This is brought inside across the insulation and firmly around the top of the second inner wall stake, back outside and around the top of the second outer wall stake (which is opposite the third inner stake), back inside around the fourth inner stake, outside around the third outer stake (opposite the fifth inner stake), and so on, until the vine reaches the opposite (porch) end of the outer stakes, where it is secured. During this a final layer of insulation is fed in, so that the lashing passes alternately over and under it while carrying from outer to inner stakes and vice versa. This tricky operation needs three men working simultaneously—one to strain up the vine and feed in the insulation, one to manipulate the outer wall stakes, and one to slide in and adjust the pandanus leaves.

The main wall is now complete. In some women's houses the porch ends of this wall are swept in for three or four feet to enclose partially the front porch. This is decorative rather than utilitarian.

Two pointed stakes about 78 inches by six inches by two inches are set in position as jambs of the entrance doorway. They are placed about 18 inches apart on either side of the house mid-line and about 30 to 36 inches behind the porch sill. Saplings are laid across the walls to form a platform, and the jambs are hammered home until they are about six feet above the ground. A tie beam about 24 inches by three inches by one and a half inches is lashed across their tops; and collar beams about three inches wide are lashed parallel to and about four inches below this (see Diagram 5). The tie beam acts as a main post. Women's houses have an inner wall between living room and pig-stalls, so a second pair of jambs about eight feet high are similarly erected in line with and from 12 to 14 feet behind the front jambs.

In women's houses the rear main post is usually a single, pointed hardwood log about six inches in diameter, whose top is dished to receive the ridge-pole. It stands about nine feet high after hammering in. In men's houses the rear main post is usually a pair of heavy, pointed stakes (also about nine feet high), set side by side, on top of which the ridge-pole rests and is lashed. Often two or three stakes are added to each side of this pair to form a half wall separating the rear curved end of the house from the front living space (see Diagram 3 (*d*)).

The heavy hardwood ridge-pole for a woman's house may be 28 feet long, nine inches in diameter at the butt (porch) end, and five inches at the other. It is lifted on to the sapling platforms previously used in the erection of the jambs and main post. At least three men (one at each end and one in the middle) kneel on the platforms and juggle the pole on their shoulders. Straightening up, they roll it from their shoulders on to the tops of the main posts, and lash it into place. Normally the ridge-pole projects about 30 inches beyond the front door jambs to reach the edge of the porch and about 24 inches beyond the rear main post (see Diagram 6).

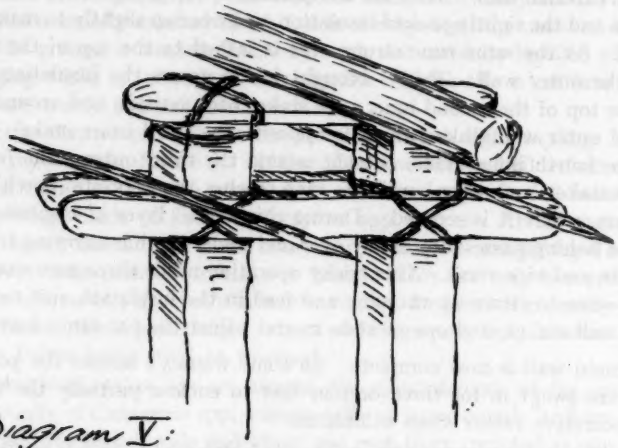


Diagram V:
DETAILS OF RIDGEPOLE, JAMBS, TIE AND COLLAR BEAMS, AND SECURING PURLINS.

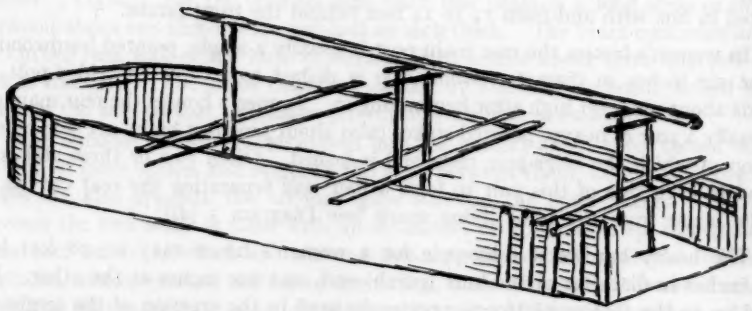


Diagram VI:
DETAILS OF COMPLETED WALLS, WITH RIDGEPOLE SET IN PLACE.

The rafters are then set in place. A sapling about one and a half inches in diameter is laid across the ridge-pole so that one end rests on and projects about eight inches beyond the side wall. It is swivelled so that the other end rests on the opposite wall, and the surplus is trimmed off with an axe. A man straddling the ridge-pole nicks the centre of the sapling, and both ends are pulled down to rest on the walls. This procedure is repeated from the porch end of the ridge-pole to the rear end, and each rafter rests in the shallow depression between each pair of external wall stakes. These rafters are not tied down. The rear rafters are similarly laid

Diagram VII:
PLAN OF RAFTERS AND SECURING PURLINS.

between the outer wall stakes at the curved end of the house, but their top ends (which have been roughly bevelled) are lashed, one on top of the other, to the rear end of the ridge-pole (see Diagram 7).

A long sapling about one inch in diameter with the butt trimmed to a point is slid point outwards through the space between the tie and collar beams outside each door jamb (see Diagram 5), and is lashed to the underside of the rafters to form a securing or collar purlin. Simultaneously a long slender split bamboo is lashed on on top of the rafters and parallel to this purlin, to form another collar purlin. These tie the rafters down to the main posts. Withes are tied to the rear ends of these purlins, on top of, and under the rafters, to continue this collar around the arc of the rear rafters.

The remaining purlins are lashed about four or five inches apart on top of the rafters, starting from the eaves on each side. Each purlin projects about six inches beyond the front (porch) rafter. The first four or five (eaves) purlins are withes, the rest split bamboo. They are vine-lashed from eaves to ridge-pole with running twists, to every second or third rafter. A vine or bamboo strap is tied to the projecting point of the lowest eave purlin at the front, and is taken under and over the other purlin points to the opposite eave purlin, passed around it, then returned over and under the purlin points to the original eave purlin, where it is secured. The strap is strained tight during this operation, and is designed to hold down the purlins if high winds blow head on to the house. Pegs about 10 to 12 inches long are wedged over this lashing and under the gable eave rafter, one between each pair of purlin points, to form false purlin points for extra support to the gable eave thatch.

A sill log or plank is wedged across the front line of the porch and is pegged into place.

Work starts on the gable wall. Five or six stakes about four or five inches wide are dropped point first between the rafters and into the ground on each side of and in line with the door jambs. They are about five inches apart and are hammered down until their top ends are flush with the rafters containing them. A double collar beam of flat wood about two inches wide is set across the gable wall at the height of the outside walls and is lashed into place. Three or four shorter collars are lashed above, and parallel to this at intervals of about six inches. The bottom collar beam where it spans the doorway to form a lintel is bound with vine to pad its sharp edges and protect people's heads from injury.

The spaces between the gable wall stakes are filled with an insulation of *Miscanthus* stems and leaves, neatly slid between the collar beams and reaching the ground. The space between the jambs above the lintel is similarly filled, and the tails of leaves hanging down below the padded lintel are three-plaited and thrust up out of sight.

Six stakes about 42 inches by three inches by one inch are trimmed and sharpened at both ends. One is planted in the ground in the porch against each jamb, one against the gable wall stake midway between each jamb and the house wall, and one against the stake beside the house wall. Between these stakes and the gable wall sheets of grey *Casuarina* bark about 36 by 12 inches are fitted in as panelling, rough side out. The sharpened tops of these stakes are lashed firmly to the corresponding wall stakes to secure the bark, which is both decoration and extra insulation. The inner ends of the bark are trimmed flush with the jambs (see Diagram 3 (*a*)).

A rod about 24 inches by one inch in diameter is lashed across the tops of the two stakes against the jambs, leaving a space of about one and a half inches between rod and lintel. This secures the two dressed hardwood planks (about 30 by 10 inches) which, stood vertically, form the door.

In men's houses this concludes the main construction before the thatching is begun. In women's houses an inner wall is similarly made to separate living room

from pig-stalls (see Diagram III (*b*)). Then a wall is made at the rear of the house forming a chord of the arc of the rear curve. Stakes are dropped down through the rafters, hammered home flush with the rafters, and secured with collar beams; but a central gap of about four feet is left between them. This is filled with short stakes, hammered in to form a stile about two feet high which keeps the pigs out of this rear sleeping cubicle (see Diagram 3 (*e*)).

Pig-stalls occupy the space between sleeping cubicle and living room. There are usually five, but occasionally only three or four on each side of the house. These are made by dropping stakes through the rafters to form jambs to the stalls on each

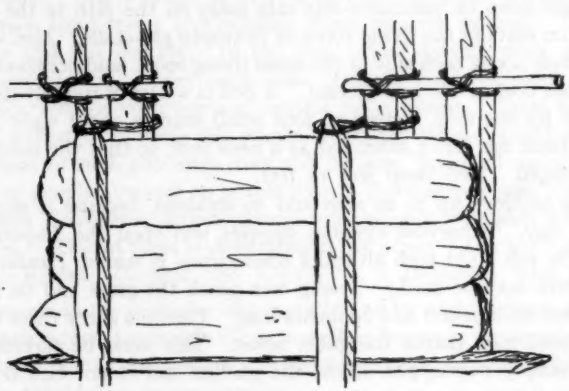


Diagram VIII:
Detail of Fence Gate

side, about 50 inches out from the side walls, while short uprights are hammered in the ground against the walls. Short planks are lashed parallel to the ground between the jambs and uprights. A collar beam and sill plank are set between the jambs, and door stakes are slid between these. Each stall is floored with rough billets of wood to keep the pigs out of their urine and dung (see Diagram 3 (*c*)).

Remaining internal features may be added while thatching is in progress, or afterwards. Two parallel planks about six inches wide and two inches thick are pegged on edge to the ground in the living room, their front ends flush against the entrance door jambs. In women's houses their rear ends are flush against the second door jambs; in men's houses the rear ends reach the main post. The front

third of this trough contains a rectangular wall of flat river stones forming the main permanent fireplace, which is used for cooking and warmth. The rest is a place for firewood and oven heating stones. Above the fireplace a heavy rectangular plank fire baffle about four feet by three feet is lashed to the rafters to protect the thatch. In women's houses a smaller similar fireplace is built in the passage between the pig-stalls. A pair of troughs about eight feet long and eight inches diameter are roughly hollowed out of a split pandanus palm log; and one is lashed to the wall on each side of the living room of a woman's house. In these are kept food and personal effects (see Diagram 1 (*b*)).

Both men's and women's houses are carpeted with a thick layer of chewed sugarcane pith, a haven for fleas and flies. There are usually no beds in women's houses; women sleep on pandanus-leaf rain mats on the pith in the rear cubicle. Visitors sleep on mats in the living room or in empty pig-stalls. Men's houses have three or four beds along each side of the main living room, and occasionally a couple behind the main post in the rear section. A bed is a pair of roughly dressed planks about five feet by one foot, resting on four small stumps about eight inches above the ground. Each bed has a short rod as a neck rest, so that the sleeper's wig will not be disarranged. Men sleep feet to feet.

Thatching employs up to 20 men and 30 children, because it should be completed in one day. Otherwise evening showers will spoil the *Imperata* sp. grass collected for the job. (At high altitudes where grass is scarce, *Pandanus* leaves or *Miscanthus* stems may be used.) Young men pluck the grass and tie it in bundles about four inches in diameter and 20 inches long. Children carry these to the house, where experienced men thatch the gable eaves. This must be carefully done, for the thatch is simply overlapped across the purlins and is not tied down. If the eaves are not well laid, the whole thatch may blow off in a high wind. Bundles of grass are flattened out and laid at right angles to the front (gable) eave. A second layer is set obliquely across this, a third layer more obliquely still, a fourth at right angles to it, and so on, the grass being brought down to meet the side eaves at right angles. This continues until a band of thatch about six inches thick and 20 inches deep runs right round the eaves. The next layers are then laid to overlap the first by about nine inches, and so on, until thatch reaches up to the ridge-pole, with an overall thickness of about six inches.

The later stages of thatching are straightforward, and are done by younger men, who stand on the roof while children throw bundles of grass to them. Grass from an earlier house may be used at this stage; but it is too brittle for eaves thatching, for which fresh grass must be used. When the thatch meets at the ridge-pole, more thatch is laid along and parallel to the ridge-pole at the porch end. Then thatch is laid back to the rear end of the ridge-pole in an overlapping herring-bone pattern about 18 inches wide, to secure the free ends of the thatch lying at right angles to the ridge-pole. Finally, thatch is thickly laid over the point where the rear rafters meet on the end of the ridge-pole. A stout peg is driven through this thatch into the cup formed by the rafters' ends; and a few stones about three

inches in diameter are laid around it to help secure the thatch against high winds. In effect, the strength of the whole thatch depends on the firmness of this peg. Then, using a plank as a cutting base, a man walks around the eaves thatch and trims it off sharply with his axe.

A fire is lit in the house and left burning for two or three days to dry out both the ground and the timber. Green *Casuarina* fronds are occasionally thrown on to smoke out insects from the thatch. The owner moves in and spends several days plugging with wads of grass any gaps, especially under the eaves, through which draughts are entering.

A woman's house always has a double yard or piazza ; a man's house may have one yard or none. This is simply fenced off by ramming pointed stakes, wild sugar-cane (*Saccharum* spp.) stems or *Cordyline* stems into the ground. The two latter usually strike and leaf quickly. In the past, when defence from attack was an important consideration, fences were more strongly made of stout stakes six or seven feet high, secured with top and central collar beams. Gates were similar to house doors, although in some the planks were laid sideways and not vertically. Slighter versions of such gateways may still be seen, intended mainly to keep out pigs ; but most people now rely on simple stiles. Entrances to men's houses through *Miscanthus* and *Saccharum* arrow screens were usually defended by heavy, well-made palisades. (One of these is illustrated in my paper " The Valleys of the Upper Wage and Lai Rivers," *Oceania*, Vol. XXVI, No. 2, December, 1956.)

House owners in the past also dug secretly and by night, escape ditches leading from inside their houses to outside the surrounding fences or arrow screens. Ditches were roofed with planks and carefully camouflaged with growing plants. Defenders used these to take besiegers by surprise.

To the south-east, down the Lai valley, most Laiap Enga build women's houses of the sort described above ; but there are a few in the Hagen-Mendi style. These are curved and enclosed at both ends, and have doorways in the sides. The main posts are of equal height, and the houses are much the same size as Mae women's houses. Some Laiap men's houses are the same as Mae men's houses ; but many are circular, about 14 feet in diameter, with a central main post. Despite these differences in styles, the actual techniques of house building are very similar for both areas.

Both Mae and Maiap Enga construct a variety of outhouses for different purposes. Men build rain shelters in gardens distant from their residences. These may be simple, open-sided, skillion-roofed sheds about eight feet by six feet and about five feet high, or walled (sometimes with thatch), gable-roofed huts about ten feet by eight feet and six feet high, with two doorways and a fireplace. A few are well built round houses about nine feet in diameter, divided in halves into an eating room and a sleeping room. Some Laiap, but not Mae, also build family eating and cooking huts beside their wives' houses. These are rectangular, about nine feet by 12 feet. The skillion roof is about three feet high at the back and about eight feet high at the

front. The hut is walled (sometimes with thatch), and a low enclosed porch projects at the front.

Young cassowaries are kept in pens in which walled and skillion-roofed shelters, about four feet by five feet and five feet high are erected. Men who care for many pigs often build larger and stronger versions of these shelters to house the pigs which cannot be accommodated in their wives' houses. These sties may contain from two to eight stalls, similar to those in women's houses. Cribs are built for cool storage of pork out of reach of dogs and thieves. These are about five feet square, with a skillion roof about five feet high at the front and three feet at the rear. The walls are of stout stakes, well secured with collar beams, and the doors are of heavy planks. The whole is supported on four legs about six or seven feet above the ground; these continue to form the corner posts of the crib. Cribs often double as fowl houses, or are erected inside fowl yards with thatched fowl houses built between their legs.

Following Administration instructions in an earlier dysentery epidemic, most Enga living near Administration stations now dig latrines as a matter of course when erecting dwellings. These are covered by huts in two styles. One is a skillion-roofed thatch-walled hut about four feet square with a screen hiding the doorway; the other is a thatched cone about three feet in diameter at the base and 30 inches high, with a triangular doorway about 18 inches wide at the base. These cones look exactly like *pumburanda* oven huts of the Karintsu clans near the Wage River, who cook pork for ghosts in them (illustrated in my *Oceania* paper already cited).

Finally, clan-owned round houses are built for infrequent rituals to propitiate clan ancestral ghosts. These houses are slightly conical, about 15 feet in diameter at the base and about 20 feet from the ground to the sharply-pointed thatched roof-top. The walls are from 12 to 15 feet high, and are made of long stakes secured by collar beams. They are of single thickness and are not insulated. No main post supports the roof, but I have not seen a Mae fertility house built or in good repair, so do not know how this is accomplished. They are essentially temporary structures.

It is clear that Enga, despite the limitations of their technology, have achieved a fairly effective adaption to the rigours of their physical environment. Given the materials with which they have to work, it would be difficult to devise dwellings better or more economically fitted to cope with their appalling climate.

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HOUSE BUILDING AMONG THE MAE ENGA, WESTERN HIGHLANDS, TERRITORY OF NEW GUINEA. PLATE I

PLATE I.

House building at Sari, near Wabag.

1. Erecting wall of a woman's house.
2. The same, at a later stage.
3. Fixing the ridge-pole in place.
4. Ridge-pole and rafters in place. Some of the purlins in place.
5. Reflection on ground of roof before being thatched. The divisions (" walls ") of the middle (the pigs') room and the opening into it can be seen.
6. Working on the front of the house.

Photographs by A. P. Elkin

HOUSE BUILDING AMONG THE MAE ENGA, WESTERN HIGHLANDS, TERRITORY OF NEW GUINEA. PLATE II

PLATE II.

7. Back of an old completed house.
8. Front of same.
9. Cooking sweet potatoes in earth ovens for the builders.
10. The potatoes in the oven.
11. Thatching the new house, from the side.
12. The same, from the back.

Photographs by A. P. Elkin.

FRIENDSHIP IN TANGU[1]

By KENELM O. L. BURRIDGE

THE primary purpose of this essay is to present field material on friendship in Tangu. While I was organizing my notes on the subject, however, an essay, by S. N. Eisenstadt, constituting a theoretical formulation of the problems involved, appeared in *Man*.[2] I have, therefore, included a brief discussion of some theoretical implications of the field material as they relate to Eisenstadt's work.

Tangu are a gardening, hunting and gathering people settled in a knot of steep ridges some fifteen miles inland from Bogia Bay on the north coast of New Guinea in the Madang District. The total population of some two thousand souls is distributed through about thirty settlements grouped into four neighbourhoods. Each neighbourhood contains one or more major settlements and several smaller ones; each of the latter being attached for various purposes to one of the major settlements. Few cultural features are exclusive to Tangu. The language they speak is also spoken by others further inland; intermarriage between members of different settlements, neighbourhoods—and even with outsiders—is fairly common; there are trading relations with selected peoples within their own milieu, and since the S.V.D. Mission began to establish itself in Tangu during the 'twenties youths have been going away to the coastal areas on contract labour. Nevertheless, though they are few and have a wide range of contacts and relationships with their neighbours who form part of a larger culture area, Tangu are, and regard themselves, as a distinct entity.

The word used by Tangu which I translate as " friend " may be written as *kwav*. Precisely the same word, or sound, is used to denote the self in objective reference, or when the self is expressed in isolation. Thus, the question " Who is there ? " is answered " *Kwav*," " I." But when what is being expressed is the self in an active or passive role the pronoun *ku* is used. " I will be going (westwards into the bush) " is *ku ingrieta*(*p*) where the *p* sound is optional. " My friend " is *kuka kwav*—the suffix *-ka* being the possessive. Plural forms are usually indicated by the suffixes *-mbwa*, *-wa*, *-wawa*; and dual forms by the suffix *-*(*v*)*ai*, where *v* stands for a variable consonant. Thus *kwavai* may be translated as " two friends," and the phrase *mapai kwavai* or *kwavwa* means " those two friends," or " these (those) two are friends."[3] Nevertheless, Tangu rarely use the dual forms when they speak of

[1] Field research was carried out in 1952 under a scholarship with the Australian National University.

[2] S. N. Eisenstadt, " Ritualized Personal Relations," *Man*, July, 1956, No. 96.

[3] Pronunciations and stress vary in different parts of Tangu, and while I have written the plural form *kwavwa* to conform to the mean, sometimes the sound comes nearer to the rendering *kwaver*.

friendship, although they use it often when they speak of brothers. "They are friends"—carrying the connotation of being made into friends—is *manda pr'kwavi*; and the bare statement that two men are friends is usually *manda kwavwa*, where *manda*, "they," is the third person plural distinct from the third person dual, *mapai*. *Naingai*, "we two," I have never heard in reference to friendship; Tangu say, "He is my friend," not "We two are friends." Similarly, I have never heard "You two friends."

Consistent with linguistic usage, friends are not to be observed walking about with each other in couples,[4] and most Tangu form the bulk of their friendships with members of another settlement, with people from other neighbourhoods in Tangu and those living in areas outside. Nor is the relationship a solitary one in the sense that a pair of friends act as a unit; it is a one-to-one relationship between two individuals, between men or between women, but never between a man and a woman. It is also a "lateral" relationship, confined to those who, by their age, could not be in a parent-child or avuncular relationship; consequently it is comparable to other "lateral" relationships such as like-siblingship, or like-in-laws, but scarcely comparable with apparently similar kinds of relationship—such as godfather-godson—which involve generation and other distinctions.[5] Friends help each other both in fact and in myth, but the relationship remains of the one-to-one kind and A may be a friend of B, who is a friend of C, who may also be a friend of A. Thus, x members of community M, all of whom have friends in community N, might easily total between them $x \pm y$ friends in N; in this sense it is asymmetrical.[6] Classificatory brothers or sisters may be friends as well as kinsfolk. All the sons of two men who are friends are friends with each other, and the daughters of two women who are friends are also automatically friends. Furthermore, a marriage between the son of one friend and the daughter of the other is considered an ideal, and marriage may also be arranged between the son and daughter of the full sisters of two men who are friends, or the son and daughter of the full brothers of two women who are friends.

Apart from inheriting friendship and confining one's friends to own generation and sex, freedom of choice is limited only by mutual consent, circumstance, and instrumental advantage. Two men from different parts of Tangu may meet and become friends while working together on some coastal plantation; or a man from Tangu meeting a stranger whilst travelling or working might want to make of the other a friend; or within Tangu and the bordering regions two men who have some acquaintance with each other—usually through a third party—may agree to become friends. And though, theoretically, girls and women have the same freedom of

[4] Cf. H. Ian Hogbin, "Puberty to Marriage: A Study of the Sexual Life of the Natives of Wogeo, New Guinea," *Oceania*, March, 1946, Vol. XVI, No. 3, p. 193, where they are to be seen in couples.

[5] Eisenstadt, *op. cit.*, p. 90, does not make this distinction; *vide infra*, p. 22.

[6] Unfortunately, evidence is lacking whereby one might say—as a recurring constant with a geographical referent—that members of community A have more friends in community B than in community C, and B has more in C than in A.

choice as youths and men, they neither travel nor have the same interests in friendships as do the men.

Men institute friendship by formally exchanging, winding on, and knotting the other's breech-clout—each dressing the other as he would himself. Women and girls perform the same ceremony with their skirts. In the old days before the disappearance of the clubhouses,[7] the ceremony was a public one and took place in or near them. To-day, however, since the period of contract labour is the nursery of most friendships—and nearly all voluntary friendships are formed during this period—the ceremony is sometimes dispensed with and the relationship is rather more informal than it was in the past. At the same time, inheritance of a friendship does not necessarily preclude a formal exchange of breech-clouts or skirts, and similarly, classificatory siblings who are also friends would normally exchange breech-clouts or skirts.

Friendship entails mutual aid, hospitality, informal gift giving; and it brooks neither rivalry nor quarrelling. Brotherhood or sisterhood in an ideal Tangu world would entail much the same things, although it is a known and accepted fact that brothers do quarrel, and are sometimes rivals. Brothers, moreover, should normally co-operate with each other in the gardens, in hunting, in building houses, and in providing feasts, whereas friends are never in such an economic relationship; nor—a consequence or corollary of economic co-operation—are they in any explicit political alliance. Brothers make demands on each other, use each other's property, and persuade each other to be more brotherly. A man may take the chewed betel from out of the mouth of his brother, or snatch the tobacco from the circlet of woven grass on his upper arm; he may say to his brother, "Come, let us work harder," or, more bluntly, "It is time you did some work!" Or, more significantly, since it is an appeal to others, "My brother whom I help is not helping me." Relationships between brothers are sufficiently defined and concrete to allow expectations to approach what Europeans would call a "right," and political status—power—in the community depends on the extent to which a particular man can realize this "right"; that is, on how many brothers out of a large range of men within that category of kinship he can actually persuade to help him in an economic and political alliance. The formal food exchanges between brothers-in-law require overt amity; but since the mark of amity lies in the equivalence of an exchange, and Tangu are extremely critical of an exchange that is not equivalent—whether over or under the mark—in fact the relationship is one of rivalry and tension, of seeing slights where none may be meant, of taking retaliatory action in consequence. *Mutatis mutandis*—in a lesser degree because they are not explicitly responsible for producing food for exchanges—the same holds good for sisters and for sisters-in-law.

When friends visit each other the greeting is warm, and they sit quietly talking. They do not make explicit demands—for food and the like—on each other. The host proffers tobacco, betel, and calls to his wife to prepare some food. The visitor

[7] Tangu clubhouses were abolished fairly soon after the mission first established itself.

usually politely demurs, and on further pressing, accepts. The stress is on giving, not taking ; on a loose moral expectation which cannot be put to the issue in public proceedings if there is a default. In other words, the relationship is personal, between individuals, and does not necessarily invoke kin, economic, or political allegiances. Friendship means giving certain kinds of help when in trouble or in need but not necessarily expecting such help on any occasion. No man would want, or expect, a friend to embroil himself in difficulties and dangers which are no business of his—matters which are the business of siblings. A man should look first to his brothers whose obligation it is to share in a difficulty and by mutual co-operation weather the storm.

Friends tell each other about their illicit sexual adventures, and the sanctions for not so informing, or confessing to, a friend are creeping flesh, blisters, sickness and perhaps even death. Once the friend has been told he scrapes the stem of a *karsuk* palm, and piercing his penis to draw blood, he mixes the blood with *karsuk* bark shavings on a leaf, wraps it up, and both friends eat of the mixture. In the case of women the confession is accompanied by eating a mixture of *karsuk* bark shavings and the friend's sexual secretions. There is no injunction to secrecy, and the friend to whom the confession is made is rather expected to gossip about it—which is itself evidence that atonement has been made, so that gossip remains gossip and no public issue may be made of it.

Nevertheless, such goings on and the stories about them do not make for easy relations between the members of a village or local community, and Tangu prefer to confess to friends at a reasonable distance. When they go down to the coast to buy salt, or gather gossip, or news, or when they travel inland to buy hunting dogs, sago, dogs' teeth, they choose routes which will take them through those villages in which they have kinsfolk or friends. The friends will give hospitality, are an insurance against the evil intentions of sorcerers, will provide information useful to the purpose of the journey, and they will gossip. Through friends a man's name becomes known outside the community circle, his achievements admired, his standing confirmed. The more friends he has, the more strength to his elbow, the more solid his prestige and influence—gained on other criteria—at home. Friends are also useful when meeting emergencies ; through, but rarely from, a friend the right kind of pig may be bought at short notice ; sometimes a holiday with a friend and away from home is wise, and often situations are best dealt with by withdrawing and visiting a friend. Few Tangu are not just so many centres of networks of friends spreading from Tangu to the coast, along the foothills of the Adelberts to Josephstaal, and around in a wide arc rather short of the confluence of the Iwarum and Ramu rivers to Hansa Bay in the Stephan Strait.

Friends give Tangu the entrée to dances and feasts in places where they may have no kin, or where, in any case, being the guest of a friend carries the privilege of immunity without denying to the visitor a right of public audience if he has something to say. Thus, a man whose hunting lands border on those of an outsider may, through a friend, attend a dance in an outside village, and there make it known—

discreetly, of course—that he is grieved at a trespass. With luck the issue may go no further: trespassing will cease. But behind the visit lies the implication that the visitor has already recruited supporters to his cause. If there is argument, or trouble, the friend finds himself thrust into the role of go-between, peacemaker, or arbitrator; he puts the case of his visitor friend to his kinsfolk and co-villagers; he reasons with his friend. Through him the dispute will be settled.

Though a man cannot demand help of a friend, he can give it—either in simple obedience to a moral imperative, or in order to precipitate a situation from which he can gain some other advantage. It happened once that A, who was annoyed with his classificatory sister B, entered her house and started to thrash her. Z, B's husband, heard the noise from the other end of the village and immediately went to her rescue. He grappled with A but was no match for a much larger man. Y, nearby, classificatory brother of A, and also a friend of Z, bounded to the scene with a heavy digging stick. But he did not enter the melée to separate the contestants and make peace between them. Instead, he put a virtual end to one set of proceedings and started another by clouting his brother on the temples with the digging stick.

Investigation showed that although A and Y were brothers and had lived together there was a deep-seated enmity between them ranging back over the years to their childhood. Trouble between them had been brewing for some time, and a matter between close kinsfolk had gradually become a political issue. Y was a man of great standing in the community; A, rather younger, had begun to challenge their relative positions. Z had not called for help from his friend; his whoops and cries should have rallied his brothers—but Y had been off the mark like a flash and the business was over before the brothers had collected their wits. It was clear, later, that although Y's reply to the question "Why did you do it?" was simply, "Z was my friend, and he was being attacked," he had, in fact, seized the opportunity to get in a shrewd blow at A—who should not beat his sister and then grapple with the husband who himself had every right to attempt to protect her. In the public proceedings that followed the assault these things, plus friendship with Z, put Y in a strong position as against A, who could only plead lack of brotherly love.

The incident, though it was an exceptional one—in that brother attacked brother, and there were friends in the same community—marks several relevant points. Although everyone was quite well aware of the relationships which underlay the overt brotherliness of A and Y, and although some other occasion might have sufficed to make the hostility explicit, most would have preferred that A and Y kept their enmity covert; and, it was the existence of a friend in the same local community which brought the issue to a head. There were, in consequence, a number of problems to dispose of. Brothers who should be helping each other were now in explicit rivalry; households which had been glad of the help and protection of both A and Y had to choose between one and the other. How did the luluai—representative of the administration, and brother of both A and Y but nearer to the former—stand? What action should he, could he, take?

In the event the luluai withdrew to found a small settlement nearby. Y stood fast. A, who although a member of the community, had already found it more convenient to live at a distance from the main settlement, was joined by some others.

If the incident reveals circumstances in which friendship—legitimately used, and one must insist on this point, for there was no public censure on helping a friend, only blame for attacking a brother—can sunder a community, it also emphasizes the proper place for a friend. Friends appear incidentally in myths to explain a relationship either between men or between women which is not one of kinship. Usually, the situation is correlated with an adventure involving men or women from different communities, and, more significantly, since marriage between the son and daughter of two friends is an ideal, friendship explains how groups with different founding ancestors—who became friends in the myth—are now knit together, intermarry, and have ancestors in common. One myth, largely concerned with friends but having other relevances, is entitled " The story of the betel nut." It may be paraphrased in relation to the present context as follows:

Once upon a time there was a village with no women—the men had it to themselves. In another village there were no men, only women. One night the women signalled a dance on their slit-gongs. A man in his village heard the sound of the hand-drums and thought: " If it was daylight I would go and look at them. But since it is night I will sleep. Later, when they signal another dance, I will go."

When next the women signalled a dance the man, Wenai, dressed himself as befitted the occasion and set off for the village. When he arrived the dance was over. Only an old woman was there. She told Wenai that the other women had long since gone to bed, but if he cared to pick two betel nuts, small ones, not overripe, eye and all, he could go in peace. This Wenai did. But on his way back to his own village the betel nuts changed into maidens, one whole, the other one-eyed, because in picking his betel Wenai had been careless and had left the eye of one nut in the stalk.

When Wenai came to his village, Mienai, friend of Wenai, came up to the latter and said, " Oh good! You can give me the one-eyed for a wife and you can have the other."

But Wenai said, " They are both mine. Look here, though, tomorrow when they signal a dance at the women's village, you go along."

So Mienai did as Wenai had done. Only he took more care in picking his betel so that the maidens he got were both whole. The wives of Wenai and Mienai bore many children, and the sons of one friend married the daughters of the other. They lived there together and the village grew large.

As near as translation can get to the meaning of words, the conversation of the friends with each other is as the storyteller put it. Mienai makes a demand on his friend which the latter evades—but does not directly refuse—by pointing out that the girls are his own. The implication is that Mienai cannot ask for what cannot be his, and by so doing he is going beyond friendship. He is no brother, but a friend. Nevertheless, Wenai goes on to put Mienai in the way of obtaining two wives for himself—a mark of true friendship which emphasizes Mienai's gaucherie. Later on, too, Wenai evidences no jealousy regarding Wenai's wives who are both whole, whereas anyone familiar with Tangu would have expected some quarrel to ensue had the two men concerned not been friends. Finally, there is the marriage between the offspring of friends, the creation of kinship through friendship.

Marriage

The normal Tangu marriage springs from kin relationships and is intimately linked to the economic and political organization of the community. Ego (male) should marry his mother's brother's daughter, and Ego's sister should marry a brother of his bride. Ideally the categories of kin should be such that mother and mother's brother are what we would call first cousins. Since the household of a married woman is in an exchange relationship with the households formed by her married brothers, the two households formed by the cross-cousin marriage combined with a brother and sister exchange come into a mutual exchange relationship under a double brother-sister link. (Diagram 1 illustrates.)

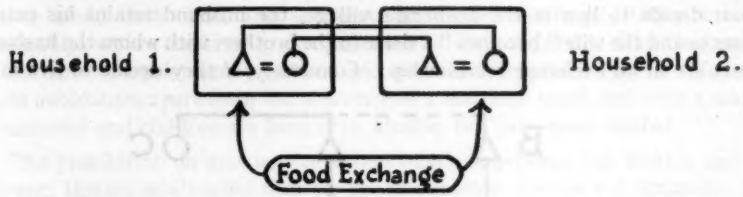


Diagram 1.

The unitary economic relationship becomes a political one when a number of brothers, the husbands of households, co-operate to make a series of feasting and dancing exchanges with the households formed by their married sisters. All the major communities in Tangu are divided into two approximately equivalent halves in this way—so that one team of brothers, under the suasion of those most renowned for their industry, wisdom and skill in dealing with others, feasts another team of brothers where the wives of each team of brothers are nominally the sisters of the other. Sometimes genealogical links do not tally with the putative relationships, but since the particular economic relationship is not conceived outside the idiom of kinship, those who are not in the correct categories to each other start off by being "as though so" and end up "becoming so." The relationship between the two teams as well as a particular part of one to a particular part of the other is always expressed in the brother-sister idiom.

At such community feasting and dancing, and during the pauses between phases of the dance, there occur what are known as *br'ngun'guni*, oratorical displays including debating and arguing, which provide the opportunity to state grievances, initiate action, and discuss any issues in public assembly. The way men speak and behave in public assemblies of this kind adds to, or subtracts from, their prestige, their influence, their power. In the same way, having the same effects, contributions to the feast speak for themselves. Since the entrée into such assemblies depends either on participation in the exchange, or having kinship or friendship with a participant, it is convenient for a male to take as a wife a woman who stands to him as mother's brother's daughter rather than another. By so doing his course is set

fair to enter community affairs with effect and climb the ladder to political influence and success.

Marriage between the son and daughter of two friends, or between the son and daughter of the full sisters of the two men who are friends, or between the offspring of the full brothers of two women who are friends, does not preclude the unitary exchange relationship that comes into existence between the household formed by the marriage and the households of the wife's married brothers; and while this does not imply insuperable hardships if the spouses come from different communities, the conflicts of claims makes for dilemmas if they do not. Sometimes the married pair can be fitted conveniently into the existing dual arrangement—if either or both have no close lateral kin, for example. If, coming from different communities, the pair decide to live in the husband's village, the husband retains his existing allegiances and the wife " becomes " a sister to the brothers with whom the husband's brothers are in an exchange relationship. Conversely, if they decide to live in the

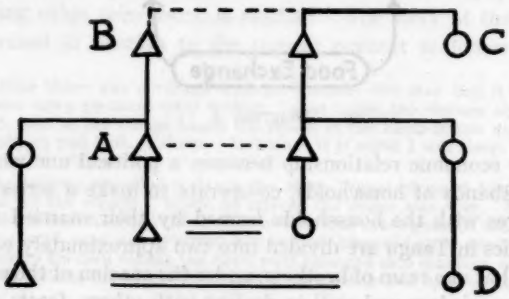


Diagram 2.

wife's village, the husband " becomes " a brother-in-law to his wife's brothers, and he co-operates with his wife's sisters' husbands. Often, however, a couple from different communities marrying under the auspices of friendship founds a settlement of their own somewhere midway between the two communities—assuming that they border one another. Nevertheless, while there is no bar to children of friends marrying within the community, it makes for complication and increased total involvement—which makes for increase in the likelihood of disputes. The corollary needs to be emphasized; if friends are where they should be—in different communities—the marriage which may result entails few internal stresses, and deflects what remains into the inter-community structure. At the same time, though an inter-community marriage brings two villages closer to one another, thus making disputes between them more likely, the kin relationship between them makes these disputes more easy to settle.

The diagram above (Diagram 2) illustrates marriage arising from friendship. The symbols being in the usual convention. vertical lines represent the parent-child relationship, broken horizontal lines represent friendship, and unbroken horizontal

lines represent siblingship. Marriage is denoted by the symbol for equivalence (=). Avoidance relationships exist between B and C, A and C, and between A and D. *Mutatis mutandis* the same diagram may be drawn for women who are friends.

The avoidance relationship—between a person and his or her friend's sibling of opposite sex, between him or her and the friend's father's sibling of opposite sex and between him or her and the child of the friend's sibling of opposite sex—concern those of different sex only. That is, when friends go visiting—and when they are married they often take their families along—possible sexual or marital entanglements other than between those who may marry are (ostensibly) prevented. On the other hand, the possible mates are not prevented from seeing and meeting each other. This is in marked distinction to other types of marriages, where the future spouses have to avoid each other and are kept apart until marriage. Other avoidance relationships within the kinship categories are hardly comparable since they presume the existence of a prior marriage bond and take their departure from it. Friendship entails avoidances apart from the existence of a marriage bond, and once a marriage has occurred and children are born of it, kinship ties have been created.

The prohibition on marriage or sexual relations between full brother and sister is strong, though in all other respects the relationship is close and intimate. After marriage, when a man's sister has been given to his bride's brother, the relationship remains close but fraught with the tensions implicit in the formal exchange relationship between the household of the one and the household of the other. Yet, whilst all parents' siblings' daughters are " sisters " for Ego (male), the mother-brother daughters are a reservoir of mates and the father-sister daughters are sweethearts ; but the father-brother, and mother-sister, daughters are not marriageable, nor should sexual relations take place. And this situation is directly linked to the fact that households of brothers, or sisters, form an economic co-operative group. Nevertheless, if the parents concerned are not full siblings—and the further apart they are the better—they can become friends and so arrange a marriage between their offspring. In this way friendship circumvents normative marriage rules,[8] and, in a sense, surmounts the incest taboo by enabling prohibited brothers and sisters to marry. Again, if—as is linguistically suggested—a friend is another self, a projection of the self or Ego, or an identification with the self, it is not hard to appreciate that any marriage between the son and daughter of two friends represents a mystical union between brother and sister.

Theoretical Considerations

When Tangu are asked " What would happen to a friend who did not act as such ? " they answer, rather puzzled, that such a thing would not happen ; and, if pressed, that they " suppose " he would be visited with boils, blisters or sickness.

[8] Incest between actual full siblings is always prohibited. But in the last two decades other forms of incestuous relationship—such as Ego (male) and father-brother daughter—have become less defined. So that to-day old people tend to shrug their shoulders and mutter darkly—" never, never in my day ! "

On reflection one can see that the question is a silly one. For all that may be expected of a friend is that he will give what he feels is wise and expedient. The penalty hazarded is a general one and applies to all situations in which Tangu would feel that some kind of moral guilt, as we would term it, is involved; when Tangu suffer blisters and boils and the like, they search their consciences to find out where they have erred. I know of no case where the sickness was diagnosed as resulting from a transgression of friendship, and since the expectations of friendship are what they are, though one friend may sometimes be chagrined, it is only because he is expecting too much: he has a " right " to expect only what the other chooses to give. This being so, and the occasions on which friendship is involved being largely confined to mere hospitality, opportunities for guilt in the relationship are virtually excluded. Obligation to act reaches as far as the conscience, and socially speaking the obligations are so far from being onerous that to contain them is simple.

If we turn now to Eisenstadt,[9] we can see that either friendship in Tangu is anomalous, exceptional, or that the " basic social characteristics " required of such a relationship[10] need broadening to the point where they become meaningless as definitive criteria. For if friendship in Tangu is " particularistic," " personal," and carries with it " important instrumental considerations," it is inheritable, and not " sanctioned by some of the most important and severe, usually ritual, sanctions." Whether it can be considered as " fully institutionalized " and " set within a framework of diffuse solidarity " is hard to say without knowing with some precision what lies behind the phrases.[11] There is also another and related point which goes to the root of Eisenstadt's argument, and on which he is relatively unequivocal[12]:

[9] " Ritualized Personal Relations," *loc. cit.*

[10] *Op. cit.*, p. 90. Such a relationship is personal, particularistic, not inheritable, fully institutionalized, set within a framework of diffuse solidarity, carry important instrumental considerations (i.e. is " useful," not merely affective), and that it is sanctioned by some of the most important and severe, usually ritual, sanctions.

[11] The phrases between quotation marks are taken direct from Eisenstadt's essay. At what point is a relationship " fully " institutionalized? What ethnographic facts lie behind " diffuse " solidarity? The point is simply that I am unable to say whether Tangu material supports or goes against Eisenstadt's formulations.

[12] Much of Eisenstadt's argument seems ambiguous and to depend on what is meant by a number of words; as a result, the reader is screened from the ethnographic facts which the argument purports to describe. At only a few points in the essay can one say with any decision " this goes for Tangu " or " this does not go for Tangu." But since the whole essay stands or falls on

(*a*) the classification together of all " ritualized personal relations," and on

(*b*) the basic social characteristics provided,

I can attempt to meet him squarely on these two points only.

Eisenstadt's basic hypothesis is that " . . . the various forms of ritualized personal relationships constitute also a mechanism of social control which tends to mitigate some of the tensions and strains in predominantly particularistic societies . . . " (*Op. cit.*, p. 90.)

Later on we have the statement that ritualized personal relationships perform some functions of social control because " (*a*) they are organized within the framework of the basic orientations and values . . . and (*b*) their organization is asymmetrical and yet complementary in relation to the organization of these societies in which most of the strains are generated . . . " (*Op. cit.*, p. 94.)

Or, (ritualized personal relations) occur " where internal strains are connected with intergroup strains, and where social integration conflicts with individual tension and adjustment." (*Op. cit.*, p. 92.)

under the term " ritualized personal relations " he includes " a variety of phenomena such as blood brotherhood, blood friendship . . . best friends . . . compadre relations . . . the godparent relation . . . contractual servantship existing between members of different castes in an Indian village, or the Kan-shing relationship reported by Fried in China."[13]

To classify friendship along with other ritualized personal relations is to see something in common with all of them, and, perhaps, to ignore what is different and significant. In what sense do relationships of this kind form a genre, or a system similar to, for example, kin relationships? The father-son relationship in societyA may be comparable with that of father-son in society B—but in what way or ways is an x relationship in A comparable with a y relationship in B? Godparent in the Christian tradition, a question largely of guardianship related to the parent-child and adoptive institutions, may be paralleled with the mother's brother in Tangu but has only a faint resemblance to friendship. The very etymology of godfather reveals its relevance to kinship relations, and if personal relations approximate to kin or quasi-kin categories then surely their context of study is within terms of the categories of kinship. By the same argument by far the greater part of the meaning of servantship would seem to lie in status or economic studies. In the preceding sections friendship in Tangu has been compared with other Tangu relationships that do not involve differences in sex, generation and (impliedly since the only " fixed " criterion of status in Tangu rests upon age) status. The whole essence of friendship in Tangu is that it is not kinship; that normative kinship behaviour can be circumvented by friendship even though friends may be kin. To assume that godparent is sufficiently like friend for comparative purposes is to compare friendship in Tangu with the mother-brother sister-son relationship, a task that makes nonsense of comparative procedure which seeks the pertinent differences between things that are largely similar.

In what way does friendship in Tangu " mitigate some of the tensions and strains "[14] to be found in Tangu society? Taking the sentence at its face value, and without examining too deeply what is meant by " mitigate," " tension " and " strain," " tension may be predicated of any relationship and more especially of one that makes any explicit demands. We have seen how the presence of a friend within the community resulted in breaking it; it is also clear that having a friend in another community both facilitates the expression of an issue or dispute, and at the same time provides a channel for settling the dispute within terms of certain conventions. If a friend were called upon to perform what was properly the task of a kinsman, friendship would be put to an unendurable strain; so that one might say with equal aplomb that kinship mitigates the tensions in friendship. What

[13] *Op. cit.*, p. 90.

[14] *Op. cit.*, p. 90, *vide supra*, p. 1, note 10.

When Firth says of friendship in Tikopia that it is "one element in the network of personal bonds which tend to mitigate the effects of existing clan and district feuds," he is not saying the same thing as Eisenstadt. R. Firth, " Bond-friendship in Tikopia," *Custom is King*, London, 1936, p. 262.

Tangu do when they feel uneasy about a particular relationship is to avoid it. They go out to their hunting lodges, or to their garden shelters; they visit a friend, or, as the luluai did, they found a new settlement. But none of these expedients necessarily prevents them from expressing a " tension " in mystical ways—sorcery and the like. In the same way, no number of friends releases a man from his obligations to co-operate with his brothers or make food exchanges with the households and his brothers-in-law—though, of course, it may well be that he feels more ready for toil after a day with his friend. And yet, if he loiters with a friend in front of his brothers, the latter may call on him, or wish to call on him, and at once he is confronted with a conflict of claims. In short, to say that friendship " mitigates tension " is not to say anything of friendship in particular.

Tangu do not necessarily seek friendships to avoid the entanglements of kin. Since friendship may lead to an ideal marriage between the offspring of two friends the relationship may be but a step to a more enduring alliance. Tangu first seek their kin—" tensions " and all. Yet if a man has occasion to have business where no kin are, a friend will suffice. Later, the grandchildren of both may be linked by kin ties. In any place at any time circumstances sometimes make it impossible to adhere to the normative rules: if there is no mother's brother's daughter available, a " sister "—who is normally unmarriageable—may be married under the auspices of friendship instead. Disputes between kinsfolk from different communities, or between communities linked by kin ties, may be settled directly through the kin links. But without kin in the opposing camp a man has no approach unless through a friend—and after such an approach it is likely that kin will be created there. In this way friendship emerges as a device for continuing or extending kin ties—the basic group allegiance upon which depends economic behaviour and political alliances.[15] Tangu may err, and it is consistent with a theme of Tangu life—in which emphasis is placed on " lateral " relations at the expense of ancestors and descendants—that Tangu should confess to a friend who is not himself implicated in what is essentially a kinship transgression. Tangu friendships range far outside the home boundaries, among peoples of different languages and distinct forms of social organization. Thus, while there must be agreement on the kind of relationship friendship is, and on its consequences, friendship does not necessarily depend on being organized " within the framework of basic orientations and values."[16] In itself neither an alternative to, nor a part of kinship relations, friendship invokes modes of behaviour distinct from those associated with kinship; it is complementary to, or " completes," a range of behaviour limited by normative kinship rules.[17]

[15] This statement is true in its context, but in the upper reaches of political life, " influence " and " power " are a matter of " making " kinsmen. So that " power " depends not on how many kinsmen but on how many one can make into kinsmen.

[16] *Op. cit.*, p. 94. *Vide supra*, p. 187, note 13. As to " asymmetrical," *vide supra*, p. 178, note 6.

[17] Only an anomalous situation—such as having a friend within the community—entails friendship competing with kinship.

To conclude. We have seen that friendship in Tangu is different from other kinds of "lateral" relationship; that brothers and brothers-in-law were deeply involved in economic and political matters whereas it was characteristic of friends not to be so involved. Second, the chief significances of friendship emerge in the context of inter-community relations, and the normal marriage under kinship rules; the nexus between both sets of facts is that while inter-community relations are, or are thought to be, desirable or necessary, the basic and preferred lines of communication follow the kin links. Friendship is here centrally placed, either to provide of itself a form of communication—particularly if no kin links exist—or to create the kin links through which Tangu normally prefer to communicate. Finally, while friendship only indirectly—and from outside as it were—serves *ad hoc* economic ends, these ends in themselves have only a small significance in relation to the overall economic process; at the same time, friendship may be the seed-bed of prestige and useful in scoring political points without involving oneself or another in political alliances.

KENELM O. L. BURRIDGE.

RACE RELATIONS ON THE NORTH COAST OF NEW SOUTH WALES

By Malcolm J. C. Calley

RACE RELATIONS as a subdivision of the general field of Culture Contact is concerned with the patterned behaviour of two or more groups towards one another. The groups involved may be whole societies, or sub-groups of the same society. Race Relations may shade imperceptibly into class structure, and may involve subordinate behaviour on the part of one group and superordinate behaviour on the part of the other.

There are two approaches to the problem. Firstly it may be regarded as a feature of the social structure of the society at large, the group which includes the two sub-groups. The sub-groups each have their place in the composite social life and the conflict between them must be regarded as a characteristic of the society as a whole. Secondly, race relations can be regarded as mechanisms making for the internal solidarity of the sub-groups a solidarity that is threatened by the presence of the other sub-group differing from it in culture and social structure.

On the North Coast of N.S.W. the groups we are concerned with are the Aboriginal mixed blood and the white Australian. There is evidence that in reality there are other groups in this complex, Kanaka (South Sea Melanesian) and European (non-British immigrant). Kanakas tend to be classed with the Aboriginal group and European immigrants with the white Australian.

Recognition of the two is chiefly in terms of skin colour and other less frequently mentioned physical characteristics, but the mixed-blood group also evinces a dialectical peculiarity, a manner of speaking which is probably the unconscious translation of Bandjalang idiom into English. This distinction is made more obvious by the very limited vocabulary of most Aborigines. Though all are quite fluent in English, many of the older people are more at home in the Bandjalang native dialects.

The White Reaction to the Mixed Bloods

Throughout the North Coast, and this would be true also for most other areas, the Aborigine is assigned a place in the social hierarchy well below that of the lowest white man and is excluded from participation in many aspects of community life. The Europeans justify this exclusion by a series of generalizations about Aborigines, by racial stereotypes. The fact that many of these stereotypes are not a true description of mixed-blood society suggests that they function in the white group as rationalizations, as a system of justifications for behaviour which is frequently recognized as being "undemocratic" and "unjust." The attitudes of most white informants to Aborigines are ambivalent; they express indignation that they con-

tinue to be under-privileged and at the same time condemn them for failing to measure up to what are probably ideal standards of white behaviour. The following are the stereotypes of " aborigines " most commonly heard in the white group. It will be seen that only some of these are an accurate picture of an actual state of affairs, and that frequently the behaviour of a few Aborigines is taken to characterize the whole group.

The Aborigines are considered to be dirty and foul smelling, possessing no conception of personal hygiene. This is true in part of station Aborigines, but is largely the result of inadequate bathing facilities and overcrowding in the houses. However, few Aborigines consider it necessary to install a bath in the house they occupy. I recorded one case on X station of an elderly father of a family who installed a bath for the use of the children but would not bath himself during winter, stating that he feared pneumonia. Scabies and other skin complaints are very common among children and less common among adults.

The second stereotype that Aborigines are diseased is closely associated with the first. By far the most common ailment is intestinal worm infestation ; hardly a child on these stations being free from either round or hookworm. Gastro-enteritis is also common, particularly so among young children. The prevalence of these complaints is a clear indication of inadequate hygiene, but there are also social factors involved ; a child does not feed exclusively, or even mainly in the home of his parents, so that even children from the cleanest families on a station are constantly exposed to infection. Young children frequently and adults less frequently (e.g., when drunk) defæcate in the yards of the houses and in the streets.

It is difficult to determine how accurate is the stereotype that asserts that venereal disease is more common among Aborigines than it is in the white community. My data indicates that seven members of the X community have had either syphilis or gonorrhœa, and rumour indicates another nine cases. A recent medical survey at U revealed four or possibly five cases. This in populations of 140 and 130 respectively. Only the U figures can be considered at all reliable. At any rate, the stereotype of the " pox-ridden " Aborigine seems to be an exaggeration, and is probably felt to be implied by the more general stereotype that all mixed-bloods are promiscuous.

There is no doubt that from the age of puberty to in some cases well into the seventies, the mixed-bloods do lead very active sex lives, pre-marital, marital and extra-marital. About eighty per cent. of women bear children out of wedlock, as contraception is seldom or never practised. There is no doubt that far more children are born out of wedlock in these communities than in the white community, but there is no possible way of comparing the degree of promiscuity in the two societies. Living on a station under the control of the Aborigines' Welfare Board, the Aborigine is liable to have questions asked about his private life that a white person would consider impertinent. The Aborigine is not nearly so secretive about his private life as is the average white man. The close proximity of relatives and neighbours in the tightly knit community precludes a great degree of privacy. Ultimately the

difference lies in the different attitudes of the two communities to sex, not in overt behaviour.

The Aborigines' Welfare Act forbids the sale of alcohol to those of Aboriginal or part Aboriginal blood who are not specifically exempted from its provisions. This is the legal expression of another stereotype, that the Aborigine is unable to " hold his grog," that he " goes mad when he has had a few drinks." In the north coast area this stereotype is made up of a complex of traditional attitudes and values.

The Aborigine is a " plonk drinker," one who prefers cheap brands of sherry or muscat to beer. Italians also tend to be looked down on because they drink wine rather than beer, and as might be expected, Italian banana growers in the coastal belt, though accepting other stereotypes, never mentioned this one. The Aborigine is also a methylated spirit drinker, and is so assigned a place on a par with the " lowest " element in the white community, down-and-out dypsomaniacs. This is usually taken to be a biologically determined mark of inferiority, " proof " that an Aborigine cannot be treated in the same way as a white man, that he has no sense of " decency " or " self respect." A note of patronization is often struck, mostly implicit, but often explicit : " It is the duty of the whites to save the Aborigine from himself by seeing that he does not obtain liquor." It is often claimed that an Aborigine becomes " cheeky " to whites when he is under the influence of alcohol and that he goes home and beats his womenfolk.

Of all the stereotypes of Aborigines held by Europeans, none are so universally accepted or at the same time so unjustified as those associated with the consumption of alcohol. In terms of actual quantities consumed, the Aborigine in this area is probably somewhat behind the white man, who is able to drink as much as he likes, whenever he likes, in the local hotel.

Because the Aborigine is unable to buy alcohol in the usual way, he is forced to buy inferior brands at blackmarket prices. He is seldom able to obtain beer even if he prefers it. The fear of detection prompts him to drink his bottle as quickly as possible, often on an empty stomach before returning to the station after work. The regulation which makes it an offence to take liquor on to an Aboriginal station prevents him from drinking at home in a leisurely fashion, and precludes the social aspect of drinking that is so important in the white community.

Cheap wine is not only drunk because it can be obtained fairly easily : it contains a higher percentage of alcohol than beer. One can become drunk more quickly and for less money. The denial of other sources of alcohol to Aborigines means that many drink methylated spirit, known in the vernacular as " metho " or " goom." Although its sale is technically forbidden to Aborigines, it is not difficult to buy in the large towns. The excuse is made that it is needed to light pressure lamps. Methylated spirit is usually mixed with some kind of flavouring, orange juice at X and raspberry essence at C. One can reach an advanced stage of intoxication for a few pence on methylated spirit.

The belief that drinking among Aborigines leads to fights or, more particularly, to wife beating, is only partly correct. I recorded only one case of a woman being

seriously injured by an intoxicated husband. It could be argued that excessive drinking in any community tends to cause domestic upsets. In the white community domestic brawls usually remain a private affair, seldom being sufficiently serious to warrant police intervention. On an Aboriginal station, however, even the slightest disturbance is likely to prompt official intervention by manager, police or welfare officer. Cases involving Aborigines are recorded and remembered; cases involving whites will almost always pass unnoticed. It is significant that a complaint by a wife often initiates intervention by the station manager, whereas in the white community such complaints would seldom be made, and even if made would not be the subject of legal action. Aboriginal women have learned to exploit these peculiar circumstances, and endeavour to enlist the support of the station manager in even the most trivial marital disputes. They are adept at manipulating the Act to their own advantage.

The stereotypes of the Aborigine as lazy, unpunctual and thriftless have been treated in an earlier paper.[1] It is only necessary to remark here that though there are many exceptions to the rule, these are roughly correct. The reasons do not concern us here.

On the north coast, it is generally agreed that the Aborigine is addicted to gambling. This would be true of a minority of the population on these stations and reserves only. Of those who do gamble, very few indeed gamble heavily. Perhaps the important thing is that gambling among Aborigines usually takes the form of card and dice games, different variations occurring on different stations and reserves. Hardly any interest is taken in horse and dog racing or the state lotteries. Generally these forms of gambling are more common among urban than among station Aborigines. In this area Aborigines gamble only with Aborigines, though I understand that on the stations of the central west a few whites, often professional card-sharpers, participate.

As playing cards or dice for money is illegal, the gambling schools are subject to raids by the police at the instigation of the station manager. Even the most innocuous game of cards held in a private house is subject to official interruption. As with sexual behaviour and drinking habits, the significant difference from the white community is not that the mixed-blood indulges to a greater degree, but that almost every aspect of his life is subject to official intervention. Much is known about a mixed-blood community, whereas little is known about a white community.

One further stereotype, which is perhaps the most significant of all and the logical basis of most of those already mentioned, is the belief that Aborigines are inferior in mental capacity to whites. This is not only put forward by lay members of the community, but often by schoolteachers who have some appreciation of the techniques used in intelligence testing; in fact, the results of these tests are often used to back the stereotypes with the prestige of "science." It is often argued that

[1] M. Calley, "Economic Life of Mixed-Blood Communities in Northern New South Wales," *Oceania*, Vol. XXVI, No. 3, pp. 201–13.

Aborigines cannot take in education past the stage of bare literacy, and that it is futile trying to educate them further; that they lack the ability to be more than unskilled workers.

Nearly all mixed-blood children score very low in the various intelligence tests administered throughout their school careers. However, the cross-cultural validity of such tests is questionable, and there is an undeniable cultural difference between the white and mixed-blood groups. Some of these differences are quite apparent; education has not the place in the home life of the average Aboriginal family that it has in that of most white families. Many parents who are illiterate or all but illiterate comprehend what goes on in school only in the vaguest terms.

Equally, the benefits which are generally accepted in the white community as being the result of education are appreciated by the exceptional individual only. When asked what benefits they expected their children to derive from learning most agreed that there were benefits, but were quite unable to name them, or to express ambitions for their children in terms of them. Some few flatly denied that there was any benefit to be derived from schooling. Education is hardly ever regarded as a means of achieving economic or social goals; it is taken for granted that the children of to-day will grow up to become manual workers, as are their fathers and grandfathers. Little incentive or encouragement is offered in the home which might prompt the children to greater effort at school. The school and the rest of the child's life are different and discrete worlds, and are seldom complementary as in the white community.

In the town of D, well paid unskilled employment is available at the slaughter-yards for boys, but as is the case with all other parts of the north coast, there is no employment, let alone well paid employment, for girls. As a result the boys leave the high school as soon as they are old enough and go to work, but the girls stay at school, many taking the Intermediate Certificate and some the Leaving Certificate. The girls register average or better than average scores in intelligence tests, whereas the boys invariably score very much below average. The girls have a stake in education: it is the only activity open to them; for the boys it is merely incidental. That this is expressed in difference in scores is the only possible conclusion.

In the past, the mixed-bloods have been the least educated section of the community. On X station most people over sixty years of age are illiterate, and quite a number of the younger people, even those in their early and middle twenties are either illiterate or barely literate. On the whole, the white community in this area is very much better educated than are the Aborigines, though relatively few have attended school beyond the minimum age required by law. This difference in the educational level of the two communities is steadily diminishing as the Aboriginal schools of to-day are in every way comparable with white schools in standards of teaching and equipment. Very few indeed of the coming generation will be illiterate, and most will have a basic education nearly identical with that received by white children in the same district. Generally the poor education of the

Aborigines is taken for granted by the white community, and is not the subject of a separate stereotype.

Such then are the stereotypes brought forward to justify the exclusion of Aborigines from the social life of the community. In some cases they are quite false; in a few they are generally true, and in others they rest on a misrepresentation of the facts or on the Aborigines' particular vulnerability to scandal.

These stereotypes both govern the behaviour of the white group to the Aborigines and provide a rationale for it. They also have a direct effect on both the Aborigine's approach to whites and his attitude to his own culture.

Behaviour Patterns of the White Group and the Stereotypes

The stereotypes find expression in the discrimination of the white group against Aborigines in the effective barring of the mixed-blood group from participation in all but a very few aspects of the community life.

It has been shown in an earlier paper[2] that mixed-blood labour has an important place in the economic structure of the area. In many industries mixed-bloods work side by side with whites, but this acceptance does not extend to other kinds of social contact. A hard line separates economic from other activities, this being most noticeable in the U district, and least so in the larger towns, particularly D. In the U area Aboriginal farm hands are never permitted to feed with the employer, whereas white hands invariably do so. Aborigines are fed under a tree, in an outhouse, or sometimes in the laundry, and are often not provided with cutlery. This happens whether a number of Aborigines are concerned or whether there is only one employee.

I was told by forestry workers that mixed-blood labour usually camps and eats apart from white labour, engaged on the same project at the same rates of pay. In the sawmills at X, where a large proportion of the labour employed is Aboriginal, white and mixed-blood labour form two separate groups for the morning tea and lunch breaks. This does not occur in the sawmills at N and C, where the number of Aborigines employed is relatively small, but is a noticeable tendency at the C mine, where they are often more than half the labour force. When D.X. first commenced work in the railway workshops at D, some of the white employees objected to sharing a room with him. This man is a valued employee who has secured promotion and is often presented as an example of the "best type of Aborigine," yet the reasons given for this action were couched in terms of the stereotypes that all Aborigines are dirty and diseased.

At the primary school in D, a parent objected to her son sitting next to an Aboriginal child. Her protest was ignored by the headmaster, who considered that he would not be justified in abetting segregation, though he privately subscribed to the stereotype on which the protest was based. At X some mixed-blood children attend the Central School after completing the primary course at the Station School.

[2] *Op. cit.*

One of these children, a quarter-caste girl of about fourteen years of age was the victim of quite savage rejection, the white children addressing her as " big black gin." In this case hostility may have been related to the fact that the girl in question was leading a very active sex life, so that rejection based on dirtiness and disease was reinforced by that which classed all Aborigines as highly promiscuous. Younger Aboriginal children at the same school during the same period were fairly well accepted; this was particularly so of two sisters of very light skin colour. Children at the convent school in D seem to be subject to persecution from fellow pupils, and also a certain amount of mistrust on the part of the teaching staff. One of the most unequivocal denunciations of the mixed-blood as " lacking in all moral sense " came from the D parish priest. The opposite is true at N, where Aboriginal children seem to be welcomed in the convent school and to have a considerable degree of academic success.

In all towns in this area barbers are reluctant to cut the hair of Aborigines. Most refuse outright. This is partly because a white man feels demeaned by acting as valet to an Aborigine, partly because the barber considers that he and his other customers may be risking infection and partly because an Aboriginal clientele is bad for business. Whites will not patronize a barber who has Aboriginal customers. No mixed-blood women aspire to permanent waves, so the problem does not arise with ladies' hairdressers. The undesirability of a too obtrusive Aboriginal custom is realized even by those storekeepers who do quite a lot of business with them. The complaint is that Aborigines tend to " hang around the store," sometimes sitting in groups on the footpath outside.

The problem of the Aboriginal clientele is solved in the field of entertainment by confining the Aborigines to a special part of the theatre, usually the front rows of the stalls. This occurs in all but the really big towns where the Aborigines form an insignificant minority. The degree of stringency with which this rule is enforced and the sanctions that are marshalled to maintain it vary from district to district. In some areas it is an implicit understanding; in others police have been called upon to evict Aborigines from seats in the white section of the theatre. Segregation is least strict in those towns remote from Aboriginal settlements and reserves, or in those towns which, while being fairly close to Aboriginal settlements, are not easily reached by public transport. The towns of X and V are cases in point. The former strictly segregates Aborigines, one admission price being charged for Europeans and another for Aborigines; it is fairly easily reached by a special " picture bus." The latter is two miles further away and does not segregate Aborigines, but there is no public transport between the station and this township at appropriate times.

Mixed-bloods are completely excluded from other forms of entertainment. They hardly ever attend local dances, and on the very rare occasions when they do it is the young men only who go, and seemingly by special invitation. This happened only once during the two years I spent in the area.

Despite the general strict division between economic and social contacts in the segregation patterns of this area, several men had accepted invitations to call on

white workmates socially. The invitation was seldom extended to the Aborigine's wife, and in the few cases in which this did occur she did not accept.

The segregation pattern is even more stringent between the women of the two groups than between the men. Men often stand in the " workmate " relationship to whites, but women only in the " employer-employee " relationship, as their only avenue of employment is in domestic service. Female domestic helps are usually fed in the kitchen, which would be most unusual for white domestic helps. It is significant that even when they call on a former employer to " have a cup of tea " the mixed-blood woman is given her cup in the kitchen, while the white housewife drinks hers in the lounge. As the two rooms usually adjoin, this does not preclude conversation.

Contacts, then, between Aborigines and whites, are always with selected members of the Aboriginal community, the male bread-winners, unless they involve an employer-employee relationship. Never are they contacts between family groups. This is even more obvious in sport ; mixed-blood men play football and take part in boxing bouts on terms of equality with whites. There seems to be no feeling against Aboriginal teams playing against white teams, or even against members of the two groups playing in the same team. Sport makes a type of relationship possible for men which is denied to the women.

This even holds true for schoolchildren. With one exception the girls have no activity comparable with the school football team of the boys. The 1954 football team from U Aboriginal school contained four white boys, the sons of local farmers and town businessmen, and though greeted with mixed feelings by the inhabitants of U, the team was received with enthusiasm by spectators at an inter-school football carnival in the large town of D, some thirty miles away.

During 1954 an avenue of social contact with the white community was opened to the schoolgirls of the U Aboriginal station with the formation of a Brownie troop. This was formed by the matron of the station on condition that membership should be open to Aboriginal children from the station as well as to the children of white townspeople and farmers. Some of the Aboriginal mothers attended the inaugural meeting, and the troop meets regularly under the leadership of the assistant teacher from the U white school.

On D.U station, an all mixed-blood Girl Guide troop operated for about two years, but was disbanded when its most enthusiastic members grew up and left the station to take jobs in the towns. Probably the Brownie troop at U has a better chance of survival, as its members are very much younger and its continuance does not depend only on recruitment of a sufficient number of station children.

In these childhood contacts between the two groups acceptance of, and action in terms of the stereotypes is not noticeable. White children do not exhibit the shrinking from close physical contact with Aborigines that characterizes adult behaviour. When competitive games required the choosing of two teams in the Brownie troop there was no noticeable tendency for choice to be in terms of colour.

Cliques within the troop were determined by differences of age rather than of colour; older white children sought the company of mixed-blood girls of a similar age rather than of younger white girls. The ceremony of the organization requires the members to kneel round a circle painted on the floor, in the middle of which stands a large papier-mache toadstool. In this there was no tendency for the little girls to form two groups according to colour. Arrangement round the circle was haphazard except that younger children of both groups tried to keep near their older siblings.

When the school football team travelled to D to compete in the inter-school carnival, the four white boys in the team showed no reluctance to drink from the same bottle of soft drink as the mixed-blood children, and some lending of football jerseys, socks and boots took place, the white boys exhibiting no unwillingness to wear clothes that had already been worn by Aborigines.

The clauses of the Aborigines' Protection Act which forbid the sale of alcohol to Aborigines affect the men to a much greater extent than they do the women. As in the white community, drinking is chiefly a male activity. Very few Aboriginal women drink heavily, and few are convicted of drunkenness as against a very high conviction rate among males. This is certainly partly because the sources of supply open to men are closed to women; a town housewife for whom an Aboriginal woman may do housework is much less likely to be willing to obtain a bottle of wine than is the farmer who employs her husband. Again, only about a quarter of the women living on a station are employed; the rest have very few contacts with members of the white community. The liquor which the men obtain is usually drunk by the men; little is passed on to the women, partly at least because it is an additional offence to be drunk on, or to bring liquor onto, an Aboriginal station.

The only way in which a woman can obtain liquor is by prostitution. Generally it is the older women who are most ready to sell sexual favours for liquor, though I recorded several cases of teenage girls being bought in this way. The practice is probably more common than is indicated by my material, though the number of women who regularly obtain liquor in this way on X and U stations would be relatively small.

Being unable to buy alcohol in any public house is a far more serious social disability than appears at first sight. It means the effective exclusion of the Aborigines from the most important social gathering in any country district. The evening " session " in the bar is the only occasion on which members of every stratum of the community meet on a footing of equality, to gossip, to conduct business and often to arrange and issue invitations to other more exclusive social gatherings, sports meetings, functions of the local branch of the Returned Soldiers' League, church dances and parties. In any small country town the hotel is the hub around which the life of the district revolves.

Most whites are well aware of this corollary to the provisions of the Protection Act. When the question was raised, it was often pointed out how impossible it would be to rub shoulders with an Aborigine in a bar. " C.X is the best worker on

the station, but I could not see myself drinking by his side in this bar." When the owner of a timber mill protested that the day would come when the Aborigine would have to be granted full equality, the speaker agreed grudgingly, but pointed out that this would " not be in his lifetime." Often it was suggested that a white man would not drink out of a glass he knew a mixed-blood had used, and that the Aborigines were too dirty to be served, that they would not know how to behave themselves, or simply that they would " spit on the floor." Here the stereotype of the " dirty " Aborigine is called upon to reinforce that of the Aborigine who " cannot hold his grog."

When questioned, all publicans vehemently deny that they ever serve Aborigines. In actual fact, most do sell wine, and less frequently a bottle of beer to mixed-bloods at " the back door." Some publicans state that they would refuse service even to Aborigines with exemption certificates (legal exemptions from the provisions of the Act), as white patrons would refuse to drink with them. I have never heard of such a case occurring, and certain mixed-bloods who do not live on a station and who are more or less accepted by the whites of the district (often being referred to as " highly respected "), are served in these very public houses whether they possess an exemption certificate or not. Aborigines of light caste are also served in districts in which they are not known, sometimes claiming to be " Maltese " or " Italian " if questions are asked. Some of the hotels in the larger towns are patronized by groups of Aborigines; in D the members of the All Blacks football team meet every evening in the same bar. It is significant that where there are several Aborigines in a bar they tend to form a group by themselves.

The stereotype of the " drunken Aborigine " finds expression in the disproportionately large number of Aborigines who are charged with drunkenness. The following figures are calculated from the charge-book of the X police station. These do not represent all charges against Aborigines in the X area; many cases are handled by the V police, some eight miles away.

Period June 18, 1948, *to December* 28, 1952.

Assault	3
Theft	1
Offensive behaviour	1
Indecent language	1
Drunkenness	31
Offences against liquor provisions of Act	9
Total	46

During this period charges against members of the white community were as follows:

Driving under the influence	3
Carnal knowledge	1
Petty larceny	3
Passing fraudulent cheques	1
Drunkenness	11
Total	19

The population of the X Aboriginal station is about 140, whereas the white population of the town is 559. It is almost unheard of for a white man to be charged under the provisions of the Welfare Act; the only charge at all likely is supplying Aborigines with liquor, and the recipients for obvious reasons never give away their source of supply. Although it is generally accepted that Aborigines can obtain liquor and the activities of the white supplier are mostly winked at, there is a tendency for the police to arrest any Aborigine who shows the least signs of being intoxicated, whereas a white man has to be very intoxicated indeed, or offensive as well, before he is liable to be arrested. In a small country community the policeman knows most of the townspeople personally, and is loath to arrest them if he can possible avoid doing so. Also, a large proportion of the arrests of Aborigines are made at the instigation of station managers, some of whom are over-zealous in policing the liquor provisions of the Act. These factors weight the liability to arrest for drunkenness against the Aborigine.

All police in this area agree that serious crimes are extremely rare among Aborigines. When convicted, offenders are treated leniently when the offence is against another mixed-blood. Penalties are very much heavier when the offence is committed against a member of the white group. Of the three cases of assault cited above, two involved only mixed-bloods and were punished by a fine of £5. The third involved the white station manager and was punished by three months' gaol. At U during May 1955, the assault of one Aborigine on another with a heavy piece of wood which caused quite serious injury requiring hospital treatment brought a fine of £10, whereas an assault on the station manager during 1954 was punished with six months' imprisonment. During September 1955 a sixteen-year-old youth of sub-normal intelligence (he could be taught neither to read nor write during five years at school) was sentenced to two months' imprisonment for participation in a theft from a white man. This was his first offence.

It is equally true that many serious crimes never come before the courts, because of the extreme difficulty of persuading Aborigines to testify against one another. A killing at U in 1953 provides the best example of this. Not one of the 130 residents would admit to knowing anything whatever about it.

A surprisingly large number of Aboriginal women claim to have been raped, some on more than one occasion, but I did not record one case in which there was sufficient evidence for a charge, let alone a conviction. It seems likely that many of the women concerned are not altogether unwilling. Carnal knowledge charges are quite frequent, but are usually dropped.

In the café in the township of U mixed-bloods are not served meals, though they can buy food at the counter. In none of the cafés in X are Aborigines denied service, nor could I record instances of this type of exclusion in any of the large towns in the area. At one time Aborigines were required to occupy the back seats on the tourist bus which passed X station on the way to Brisbane, but this seems to have been a rule introduced by a particular driver and not supported by the bus company.

Generally there is more camaraderie with bus and taxi drivers than with any other section of the white community, these being frequently referred to and addressed by christian names. Taxi drivers, particularly in the X area, depend on the station people for a large proportion of their custom.

Nearly all other Europeans are addressed as Mr. So-and-so. This is an invariable rule at U, and there are only a very few exceptions at X. Whites collectively are often referred to as " bosses " in the U district, whether they employ Aboriginal labour or not. This usage makes the social distance between the two groups quite clear. Aborigines are invariably addressed by christian names, and are referred to as a group by a number of terms which I arrange here in descending order or offensiveness from the Aborigines' point of view: Nigger, boong, coon, Abo, Aborigine, Black, blackfellow, coloured. It is worthy of note that this is not necessarily the " order of offensiveness " in other areas. Here there is little or no insult implied by the use of the word " blackfellow," whereas in N in the central north-west it is felt to be most insulting. " Boong " and " coon " appear to date from the last war.

The attitude of the churches to the stereotypes is also a part of the pattern. Because the Aborigines are " promiscuous " they are inferior to white Christians. Many members of the clergy consider them hopeless from the point of view of organized religion, and few make more than a half-hearted attempt to induce them to participate in church activities. The Church of England, particularly in the large town of D, is loath to encourage them to attend Communion services, as members of the white community would object to drinking from the same Communion cup. This problem does not arise in those churches using individual Communion cups. A Catholic priest in D expressed what nearly all other members of the clergy tacitly accept, that it is futile marrying Aborigines, since " they do not understand that marriage is a rite of the Church "; he married Aboriginal women to coloured servicemen during the war with the greatest reluctance.

At least a partial exception to this rule is the Church of Christ in the town of M, which has tried for some time to induce Aborigines from the B reserve to attend services at their church in the town.

On at least one occasion an Aborigine has been asked to preach in this church, and members of the congregation attended the annual convention on the reserve. Even this apparently wholehearted acceptance of the Aborigines has its discriminatory aspects. These activities are regarded by most members of the congregation who engage in them as " good works," as something unpleasant undertaken to gain religious credit, analogous to a mediæval sovereign washing the feet of beggars. The reserve is generally regarded in the town as a " den of vice " and the fraternization of the Church of Christ is as much a mission activity as an equal participation in religious rites.

Generally, the attitude of the white clergy and their congregations is that Aborigines are specially catered for by various mission bodies, particularly the United Aborigines' Mission, and that there is therefore no need for them to be

absorbed into the white congregations, particularly when most members of these congregations would not welcome them. The presence of the U.A.M. in this area means the segregation into two separate congregations, Aboriginal and European church members. Its presence is one of the most important factors perpetuating the social exclusion of Aborigines from the religious life of the community.

As a missionary body, its presence is unnecessary now that all but about half a dozen of the very old people are nominal Christians. The very fact that Aborigines here are still singled out as a mission field implies that in the view of the missionaries especially they are more "wicked" and "sinful," more in need of "salvation." The presence of missionaries in this area implies an acceptance of, and is partly prompted by, the stereotypes.

Before considering the reaction of the Aboriginal communities to this rejection by Europeans, the very few mixed-bloods who have won a degree of acceptance by the white community must be mentioned. These are predominantly but not exclusively resident in the towns, and have little or no social contact with the station people. Nearly always they are immigrants from other tribal territories and have no relatives on stations in the vicinity. Socially they tend to form a clique most often centred around membership in a football team. They are not debarred from drinking in the public houses, and belong to unskilled or semi-skilled economic groups. Invariably they are better educated than are the station Aborigines, and are commonly accredited with being "as clean as white people." The tendency, very obvious in other parts of the State, for them to occupy a particular quarter of the town, is also noticeable here, more so in D than in the other towns.

The Europeans definitely distinguish these from the station Aborigines, and accord them a degree of acceptance, while they themselves look down on the station people as an inferior "class." Intermarriage with the white group occurs more frequently in this "class," though more than eighty per cent. of marriages are still contracted with other Aborigines, preferably with other members of this "class."

Significantly, it is only by severing connection with the stations and reserves, by cutting themselves off from the Aboriginal communities, that they are able to escape or mitigate the stigma of the stereotypes. There are families on stations, particularly X, who live in better homes, are every bit as clean, and are economically more prosperous than many members of this urban "upper class," but who do not enjoy anything like the same degree of acceptance by the white community.

The Aborigines' Reaction to Rejection

It is incorrect to think of the Aborigine as constantly seeking acceptance by the white community only to be faced by constant rejection. In this area, and to a less marked extent in other areas, the effect of discrimination has been to turn the Aborigine's attention to the potentialities of his own group, so that the station communities are developing an increasingly healthy social life of their own. The station Aborigine is not the victim of frustration in every aspect of his social life, a strong feeling of solidarity with his own group compensates for "not belonging"

to Australian society as a whole. His attitude to the white group is ambivalent; he accepts and also resents the position of inferiority assigned to him. He often believes in the Aboriginal stereotypes more vehemently than do most whites.

He has constantly been told, and has come to believe that his manner of living is inferior to that of the white man.

One old man objected to children on X station playing with toy spears, and another old man, an ardent Christian, refused to discuss aspects of the pre-contact culture with me on the grounds that the sooner his people forgot about such things the better. These are isolated instances, certainly not typical, but nearly all the old people accept the stereotype of the Aborigine who " goes mad " when drunk, and any proposed modifications of the law forbidding the sale of liquor to Aborigines is vehemently opposed.

The stereotype of the " lazy " unpunctual Aborigine is never accepted, and that of the " dirty " Aborigine indignantly rejected, though most people agree that the unhealthiness of the children is the result of insanitary living habits. Here there is a marked tendency to transfer the blame to the Aborigines' Welfare Board, who should " do something."

This exemplifies one of the basic attitudes to the white community. It might be termed a parasitic approach, the view that all the troubles of the Aborigine can be cured by the white administration, and that it is their responsibility. The failure to bring about a cure is often taken as a manifestation of ill will.

Whites are divided into two categories: those who are " good to " and those who are " not good to " Aborigines. Little kindnesses, a human interest in the Aborigine and his family, and a willingness to suspend the cruder aspects of segregation mark the first group. To the second group belong those who are openly rude and aggressive to Aborigines, and who never fail to act in terms of the stereotypes and make it quite clear that they are doing so. The important thing about these relationships is that the mixed-blood accepts the civility of the first group as a boon, as a gracious surrendering of rightful privileges. Very few claim such treatment as a right, and the few who do are considered " bad types " by the white community and sometimes suspected of " Communist sympathies."

The use of the word " boss " as synonymous with " white man " is paralleled at X by " mistress." A white woman who has employed an Aboriginal domestic help is always referred to by the help as " my mistress " or sometimes " my old mistress." A " mistress " who was wont to distribute bounty in the form of discarded clothing is remembered with affection.

In many subtile ways the social distance between the two groups is recognized by the Aborigine. At the U.A.M. convention held near the town of M separate lavatories were erected for the two groups. This took place before any whites arrived on the scene, and was pointed out to me with pride by one of the Aboriginal organizers as a demonstration of how capably the conventions were run. Nearly always in the U area, and only less frequently elsewhere, an Aborigine will speak to a

white man in the street only if he is alone, never if he is in company with other whites. This is paralleled by the refusal of many white employers to " recognize " an Aboriginal employee in the street. An X man expressed displeasure with his wife for engaging in a heated dispute with the proprietor of a radio repair shop. " Anyone would think that she was a white woman."

Probably from bitter experience in the past the Aborigine has learned that in a dispute with a white man he is almost certain to come off worst. All informants protested that they " got on very well with white people " and that they " kept out of trouble." " Keeping out of trouble " is valued behaviour in all but one family in the area. This exceptional family is noted for the regularity with which its male members " get into trouble." The eldest of the children told me that " my brothers know how to talk to white people, they do not talk up to them like the other people around here do." It is significant that it was only with the greatest difficulty that I could persuade informants to address me by my christian name, and it was some time before they could do so without obvious signs of embarrassment.

Generally, the relationship between the two groups are strictly patterned, and the Aborigine feels most at home when acting in terms of this pattern. He knows just what behaviour to expect from a member of the white group and exactly what is due in return ; were it not that he is constantly being told that he should seek equality, that he should not accept his inferior status, that he is " as good as " the white man, the idea would seldom if ever occur to him. A keen sense of what is " justice " and what is " injustice " is part of the European tradition ; it cannot be taken for granted that it is a part of native Aboriginal cultural tradition also, in fact the opposite is suggested. Many tales are told of massacres perpetrated by Europeans during the early days of contact. Though the victims are usually relatives of the narrator, such tales are told in a very matter-of-fact manner without any suggestion of sentiments of outraged justice. Often the manner in which a white man stole the wife of a fellow tribesman is cause for considerable mirth.

Of the innumerable every-day contacts between the two groups very few indeed are marked by friction. When asked about segregation, most informants express disapproval, but very few indeed are preoccupied with it to the point of neurosis. This is the pattern on the far north coast of N.S.W. only, and extending these conclusions to other areas would not be justified. Elsewhere race relations seem to be marked by a far higher degree of conflict. In N, for instance, I was told that during a recent flood parties of Aborigines held drunken parties in the main street of the town, exulting in the misfortunes of the hated white man, and that most refused to assist in rescue work.

Conflict on the north coast occurs chiefly over wages and the inability of Aborigines to buy liquor. Of the disputes with whites that I recorded, nearly all had an economic basis, involving either the failure of the employer to pay adequate wages, or an attempt by him to take advantage of the illiteracy of the Aborigine over scrub-falling and other contracts. One case was recorded of a timber mill strike being caused by the manager's use of the epithet " black bastard " of one

of his Aboriginal employees. In the U area ill feeling towards whites always took the form of a complaint about rates of pay, which were, until recently, sufficient for bare subsistence only.

Nearly all of the young males (excluding "Christians") rebel against their exclusion from hotels, and delight in circumventing the regulations by obtaining liquor and getting drunk. It is notable that antipathy towards whites is more freely expressed during intoxication than when sober. One man at U asked me how many beers the manager of the station had when he went to town, and insisted that he had a right to drink the same number. Fines and gaol sentences for drunkenness and being in possession of liquor are no deterrent. Two men told me that a spree was well worth a £5 fine, and that as they were earning good wages, they could easily afford it. One X man considered the cheapest way to have a drink was to forfeit the £2 bail. Although police are feared, it is generally recognized, even if grudgingly, that they are "only doing their job." Most antipathy is felt towards the white informer who insists that the police make an arrest and confiscate the hard-won bottle of wine.

Aboriginal Exclusion of Europeans

Just as whites exclude Aborigines from much of their social life, so the Aborigines have a number of institutions quite apart from the white community. The religious congregations of the white community are paralleled by the Pentecostal movement which has gained a large following and great influence over the last two years. There is no doubt that the feeling of worth that membership in this movement confers is in part a reaction against the inferior status assigned to them by the whites.

It is tacitly accepted, and often claimed quite openly, that though the whites have all the good things of this life the Aborigine can expect to be compensated in the next. Much is made of the parable of Lazarus and Dives, particular emphasis being placed on the ability of Lazarus to look down from Heaven and exult in the torments of the damned. It is claimed that the "first shall be last and the last shall be first," that the Aborigine, because he was the last to receive the Gospel, and is also the last in social prestige, is the most beloved of God.

Distinct from the ultimate rewards of the next life are the immediate mystical "gifts" that are showered upon the Aborigine to the virtual exclusion of whites, the "Gift of the Holy Ghost" which has its external manifestation in "speaking with tongues." The values in terms of which the Aborigine is assigned an inferior status are rejected, and replaced by religious values which make him appear in his own eyes far superior to the most exalted white man. It is significant that this movement is led by Aborigines, and is regarded as being in a measure opposed to the missionary led U.A.M. (United Aborigines' Mission), which it has almost supplanted.

Probably the most important cultural element marking the Aboriginal community off from the white is the continued use of the Bandjalang language. This is

self-consciously and deliberately used by the Aborigines as a mechanism by which the white man can be excluded. Though few of the younger people are fluent speakers, nearly all know sufficient to serve in situations of this nature. It is always used to give warning of the approach of police or an officer of the Welfare Board. Offensive remarks are made about whites in their presence, or a conversation is carried on with the intention of excluding them. I attended one meeting of a citizens' association at X when both manager and teacher were unpopular. Nearly all business was conducted in the language, the chairman translating from time to time with an air of condescension.

Among the younger people, the language is used on the football field to give directions to team mates, which are, of course, not understood by the opposing white team.

This is one side of the picture; on the other side the speaking of the language is taken to be a badge of inferiority, the mark of the uneducated old-timer. There is often friction between the aged and the young over this: one old woman complained bitterly to me that "these young people won't talk to you if you talk in the lingo; they say: 'we don't want to hear any of those old things,' and walk away." I have heard young people say to their seniors: "Shhh! don't talk in the lingo, the white people might hear you." Many Aborigines admit that they feel most self-conscious talking the language in the presence of whites. "We feel ashamed to let them hear us," as one woman phrased it. This ambivalence towards Aboriginal culture is characteristic of these communities; now one side of the ambivalence finds expression and now the other.

During the last two years there has been a tendency for language to be more vigorously affirmed as a value. There are two factors responsible for this. Firstly, Aborigines have become aware that the large number of European migrants in Australia continue to speak their native languages. "If these foreigners can talk their lingo, why should we be ashamed of ours; we have a right to our own lingo in our own country." Aborigines have also noted that, on the whole, Europeans are willing to accept them to a much greater degree than are white Australians. The only white man who paid a social visit to an Aboriginal family at X during my period of residence was a European migrant. The second factor is the development of the Pentecostal cult, which insists on the "equality of all before God" and often makes use of the language in prayers and exhortations.

Although not developed to the same degree, the Aborigines have certain stereotypes of whites more or less comparable to those which whites have of Aborigines. Often these are intended as an answer to the European stereotype. For instance, in reply to the stereotype that the Aborigine is shiftless and permits his relatives to sponge on him, it is said that the white man has no feeling for his kin, that he is hard-hearted. Sometimes a justification of this aspect of Aboriginal life is couched in scriptural terms and is seen as charity to the poor. Being poor is itself justified as being "Christ-like," while the whites are represented in something in the light of the Roman soldiers crucifying Christ.

The more sophisticated Aborigine will also reply to the stereotype of the promiscuous, libidinous Aborigine in two ways. He will claim that the Aborigine is honest about his sexuality, whereas the white man is covert and hypocritical. He will also defend the Aborigine on the grounds that all his sexuality is straightforward and unencumbered with perversion, whereas with the white man it is often "unnatural." This was made the subject of a sermon by a Pentecostal preacher who had lived in a Sydney slum during the Depression. Homosexuality in particular is presented as characterizing the white group, perhaps with some justification, as I heard of only one case in these Aboriginal communities over the last five years.

Possibly this attitude to the white group goes rather deeper than an intellectual justification in the above terms. Though pre- and even extra-marital relations of a woman with another member of the mixed-blood community is considered more or less normal, relations with a white man are most reprehensible. In disputes between two women, accusations of this are always shouted across the station as the ultimate insult. The implication is certainly that money or liquor has been accepted in return for such sexual favours, but there is also a suggestion that there has been something unnatural about the liaison. One woman, explaining the presence of a son by a white man, excused herself: " . . . honest, I was so drunk I did not know what was happening that night."

The same feeling of shame is not a feature of liaisons between Aboriginal men and white women; in fact males boast of such adventures. Here the dominant motivation is the degradation of a white woman by conquering her sexually. Symbolically, the Aborigine defies the "superior" white man by degrading his womenfolk. This was stated explicitly by certain Aboriginal women to show that *their* menfolk at least were "one up" on the white man.

Hostility to whites is seldom expressed openly. Since the first armed clashes with the Europeans over a century ago, the Bandjalang have learned that they must always come off worst in such encounters. The essential ambivalence to whites is seen again in the use of the two words *mada* (master) and *dugai* (stinking corpse). On several occasions Aboriginal parents have reprimanded their children for addressing me as *dugai*, as they felt that its use was most insulting.[3]

Football games also tend to bring latent hostility to the surface. I have heard onlookers give directions, in Bandjalang, how best to injure members of the opposing white team. On the football field, a flaring of hostility is not infrequent, though seldom does this end in a brawl involving both referee and onlookers, as happened at X during 1956. Aborigines expect to be slighted and expect the referee to favour the white team. The slightest error of judgment on his part is likely to be interpreted as discrimination.

Often fights on the field are precipitated by a white man calling an Aborigine a "black bastard." When used by one white man to another, the word "bastard"

[3] This term is in use only among the northern Bandjalang. In the south a white man is called *jiralee* (f. *jilligan*), which seems to be much less insulting. The feminine of *dugai*, *dauragan*, is never used of a white woman, but a corruption of the English, *womerigan*, is substituted.

is seldom intended to give offence, or taken as so doing, and this is probably because so few white people are indeed illegitimate. Among Aborigines, on the other hand, a large percentage are indeed legally illegitimate, and they bitterly resent being reminded of the fact. I am convinced that seldom is an insult intended by the white players; that, on the contrary, the use of the word is an attempt to be friendly and informal. It is felt that the Aborigines are "looking for a fight." The word has become so much a part of the every-day Australian vocabulary that whites find it difficult to appreciate the Aborigines' strong objection to its use.

Boxing also, sometimes, but certainly not always, provides an avenue for the expression of hostility. On several occasions I have been told by Aboriginal boxers that they will only accept fights against white men, that they will not fight "their own colour."

The foregoing are regularly occurring opportunities for the expression of inter-group hostility. Now and again some particular happening will trigger off similar often much more exaggerated reactions from both groups. While I was at X in 1955, a twelve-year-old schoolgirl was raped by a young Aborigine. In the bar of the hotel on the evening after the event some of the white men present acted quite hysterically, calling for revenge on the Aborigines (significantly as a group). One man stated that he would like to take a bulldozer and "push their houses over," while others were for forming a lynch mob to seek the culprit. Though hostility was freely expressed in the most extravagant terms, no action whatever was taken.

The first reaction of the Aborigines was to disown the ravisher. It was pointed out, quite justifiably, that "he does not belong to X," that "his tribe is quite different from ours." A small minority held that ravisher or not, he was still an Aborigine and that they would give no assistance to the police. Despite the fact that the man did not belong to the X community, there was a very apparent feeling that in some way the group was responsible, and that all members could expect to be made to suffer by the whites on account of it. One man told me that a visit to the town caused him acute embarrassment. He felt that all the white people were looking at him and wondering whether he were a ravisher also. He would not go into a shop when he noticed that a relative of the girl was inside.

The evening after the occurrence a fifteen-year-old boy asked me to drive him into town to look for his mother. When questioned, he told me that she was late home and that he feared for her safety, that the white men in the town might rape her to even up the score.

Conclusions

The relationship between two such mutually exclusive groups as the Aboriginal and European on the North Coast of New South Wales may be considered from two different angles. First, as aspects of the overall social structure of the society as a whole, and second, as mechanisms making for the continued existence of the groups concerned.

We have seen that the European group has some almost universally accepted stereotypes of the Aboriginal group. These provide the rationale for its continued exclusion from the social life of the European community. It has been shown that only some of these stereotypes are correct, and that Aboriginal communities are in a particularly vulnerable position with regard to scandal because the private lives of their members are the specific concern of certain members of the European group. In the realm of sexual behaviour, around which the other stereotypes cluster, the difference lies not so much in the behaviour itself as in the public nature of this behaviour. Aborigines neither value privacy so highly nor have they the same opportunities for maintaining it as have European Australians.

The Aboriginal sub-group has similar stereotypes of the Europeans, and, perhaps every bit as significant, its members tend to accept many of the stereotypes about themselves which are held by the Europeans. It has a similar kind of rationale for the exclusion of the white group, and there is a tendency for the inferior social status assigned to Aborigines to be accepted. In none of these communities is insistence on equality with whites or open hostility to the white group valued behaviour. This suggests that the structural relations between the two groups are relatively stable. On the other hand, the ambivalence of both the attitudes of Europeans to Aborigines and of Aborigines to their own and the European way of life suggests a degree of fluidity.

Europeans are unwilling to accept Aborigines as social equals, and yet they are indignant at the undemocratic nature of discrimination. The Aborigines vacillate between resentment at the inferior social status assigned to them with a concomitant rejection of Aboriginal culture and an acceptance of this status and a reaffirmation of Aboriginal values.

The Pentecostal cult focuses the social withdrawal of the Aboriginal group. In it the Aborigine finds a value system different from that of the white community and one in terms of which he can feel worthy. Pentecostalism is the positive result of segregation; for the Aborigines it functions as a patterned social expression of the separateness of the two groups.

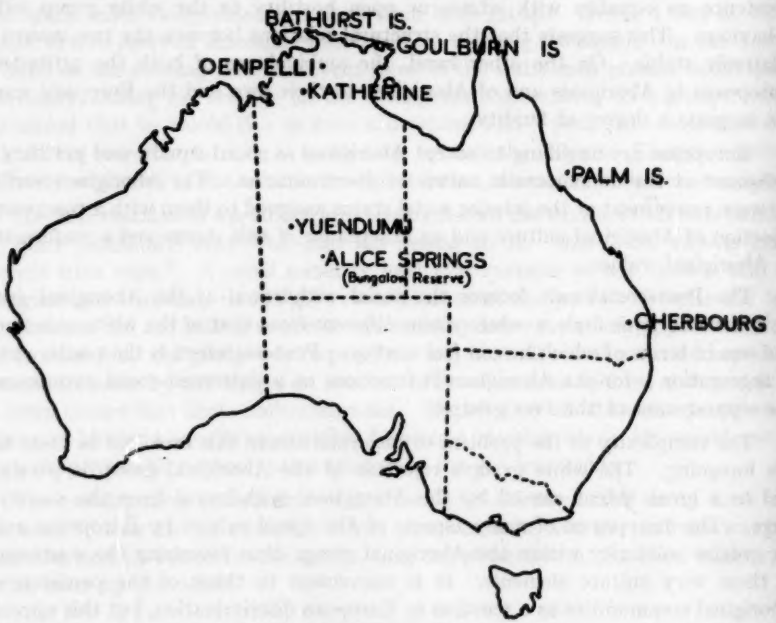
The complexity of the problem of race relations in this area will be clear from the foregoing. The white group's rejection of the Aboriginal group is paralleled and to a great extent caused by the Aborigines' withdrawal from the society at large. The disapproval of many aspects of Aboriginal culture by Europeans makes for greater solidarity within the Aboriginal group, thus favouring the continuance of these very culture elements. It is convenient to think of the persistence of Aboriginal communities as a reaction to European discrimination, but this approach is one-sided. The constant interaction of two culturally and historically dissimilar groups tends to prevent their becoming welded into one. What makes for the solidarity within these groups also makes for the segmentation, and in this case perhaps the stratification of the society at large.

MALCOLM J. C. CALLEY.

THE BLOOD GROUPS OF A FURTHER SERIES OF AUSTRALIAN ABORIGINES

By Olga Kooptzoff and R. J. Walsh[1]

In 1951 Sanger, Walsh and Kay published the results of the blood grouping, in this laboratory, of 178 Australian aborigines. The blood samples were obtained from Bathurst Island in the Northern Territory and from Cherbourg and Woorabinda in Queensland. Simmons, Graydon and their co-workers (1944, 1944a and 1948) had previously published several papers on the ABO, MN and Rh groups of the aborigines and recently (1954) have reported the blood groups of a further 167 aborigines in the Northern Territory and South Australia.



Since the publication from our laboratory (Sanger *et alii*, 1951) we have tested a further 166 aboriginal subjects from the Northern Territory and Queensland. It is apparent from the results that have already been published that there is a wide

[1] From the New South Wales Red Cross Blood Transfusion Service, Sydney.

variation in the blood group distribution in different parts of Australia but the ethnological significance of this has not yet been determined. It is unlikely that more specimens will be tested in our laboratory in the near future, and on the suggestion of Professor J. B. Birdsell we have decided to record the results obtained on the 166 subjects examined. The samples were obtained from widely separated areas and the results again demonstrate the differences between aborigines in the Northern Territory and in Queensland.

Materials and Methods

The samples from Palm Island and from the Cherbourg Mission were collected by Dr. Mary Macken and on each occasion were tested on the fourth day after collection. Those from Katherine were obtained by Dr. K. H. Dudson. All the remaining samples from the Northern Territory were collected by Dr. R. R. A. Brock and were tested between two and four days after collection. The regions from where the samples were obtained are shown on the map.

TABLE I

ABO Groups of Some Australian Aborigines

Region	O	A_1	B	A_1B	Total
Palm Island, Qld.	24	11	3	1	39
Cherbourg, Qld.	15	12	2	0	29
Bathurst Island, N.T.	10	2	0	0	12
Goulburn Island, N.T.	5	2	0	0	7
Oenpelli, C.M.S., N.T.	10	2	1	0	13
Yuendumu, N.T.	5	13	0	0	18
Katherine, N.T.	6	3	1	0	10
Bungalow Reserve, N.T.	17	21	0	0	38
Total	92	66	7	1	166

Gene Frequencies

Queensland	Northern Territory
O =0·7558	O =0·7328
A_1=0·1972	A_1=0·2535
B =0·0470	B =0·0137

All the samples were tested for the A_1A_2BO, MNS and Rh groups. They were not examined for other blood group systems because of the scarcity of testing sera and because the instability of the agglutinogens during transit had been demonstrated in the earlier work (Sanger *et alii*, 1951). The gene frequencies were calculated by the methods previously described by Walsh, Kooptzoff, Dunn and Atienza (1954).

Results

The ABO groups are shown in Table I. All samples reacting with anti A serum were also tested with anti A_1 but no negative reactors were found. Gene

TABLE 2
MNS Groups of Some Australian Aborigines

Region	MMS	MsMs	MNS	MsNs	NNS	NsNs	Total
Palm Island, Qld. ..	0	3	0	15	0	21	39
Cherbourg, Qld.	0	0	0	15	0	14	29
Bathurst Island, N.T. ..	0	0	0	5	0	7	12
Goulburn Island, N.T. ..	0	0	0	5	0	2	7
Oenpelli, C.M.S., N.T. ..	0	1	0	4	0	8	13
Yuendumu, N.T.	0	2	0	9	0	7	18
Katherine, N.T.	0	1	0	6	0	3	10
Bungalow Reserve, N.T.	0	5	0	23	0	10	38
Total	0	12	0	82	0	72	166

Gene Frequencies

Queensland	Northern Territory
Ms=0·2647	Ms=0·3571
Ns=0·7353	Ns=0·6429

frequencies have been calculated for the 68 Queensland subjects by combining those from Cherbourg with those from Palm Island. It will be noted that the B gene was found both in Queensland and in the Northern Territory, but more

TABLE 3
Rh Groups of Some Australian Aborigines

Region	R_1R_1	R_1R_0	R_1R_2	R_2R_2	R_2R_0	R_0R_0	R_1R_z	R_zR_z	R_2R_z	Total
Palm Island, Qld.	19	7	7	0	0	1	1	1	3	39
Cherbourg, Qld. ..	11	7	4	0	1	1	4	0	1	29
Bathurst Island, N.T.	6	5	1	0	0	0	0	0	0	12
Goulburn Island, N.T.	6	0	1	0	0	0	0	0	0	7
Oenpelli, C.M.S., N.T.	8	0	5	0	0	0	0	0	0	13
Yuendumu, N.T. ..	2	2	11	3		0	0	0	0	18
Katherine	9	0	1	0		0	0	0	0	10
Bungalow Reserve, N.T.	16	1	17	4		0	0	0	0	38
Total ..	77	22	47	8		2	5	1	4	166

Gene Frequencies

Queensland	Northern Territory
R_1=0·6642	R_1=0·6924
R_2=0·1174	R_2=0·2487
R_z=0·0634	R_z=0·0000
R_0=0·1550	R_0=0·0589

commonly in Queensland. It was probably introduced into Queensland in recent times by Melanesians, but its presence in subjects from the Northern Territory suggests the possibility of some Caucasian mixture.

The MNS groups are shown in Table 2. The absence of positive reactors with anti S is striking and confirmed the original observation by Sanger (1950). There are probably no positive reactors with anti S among full-blooded Australian aborigines. Simmons, Graydon and Semple (1954) encountered one S positive subject in the Northern Territory but were unable to obtain a further sample of blood. Walsh (1952) also found a positive reactor in Queensland but in this instance there was probably some Melanesian or European element in the ancestry.

The Rh groups are shown in Table 3. All the samples were tested with anti D, anti C, anti c and anti E sera. In some batches those samples which gave positive reactions with anti E were also tested with anti e serum. This was not possible in the later part of the survey, and in these instances the genotype cDE/cDE(R_2R_2) could not be distinguished from the genotype cDE/cde(R_2r) and cDE/cDe(R_2R_0). It is also possible that in these batches some subjects who are shown as CDe/cDE(R_1R_2) are really CDE/cDE(R_zR_2). It will be seen that the chromosome CDE(R_z) was found in Queensland but not in the Northern Territory. This confirms the findings of previous workers.

Summary

The ABO, MNS and Rh blood groups have been determined on 166 aborigines from several different regions of Australia. The results generally agree with those previously reported and demonstrate differences between the Queensland and Northern Territory natives. In both regions there is a low incidence of group B and a complete absence of reactors with anti S. No other native race in the Pacific shows these characteristics. It is probable that the B gene was introduced fairly recently to the Australian aborigine.

Acknowledgements

The authors are indebted for the blood samples to Dr. Mary Macken of the Department of Health, Queensland and to Dr. R. R. A. Brock and Dr. K. H. Dudson of the Department of Health, Northern Territory.

References

Sanger, Ruth, Walsh, R. J., and Kay, Patricia M. (1951) : " Blood Types of Natives of Australia and New Guinea," *American Journal of Physical Anthropology*, Vol 9, p. 71.

Sanger, Ruth (1950) : " The MNS Blood Groups of Australian Aborigines and New Guinea Natives," *Nature*, London, Vol. 165, p. 939.

Simmons, R. T., Graydon, J. J., and Hamilton, Patricia (1944) : " The Rh Factor in the Blood of Australian Aborigines," *Medical Journal of Australia*, Vol. 1, p. 553.

Simmons, R. T., and Graydon, J. J. (1948) : " The Rh Blood Types in Australian Aborigines," *Medical Journal of Australia*, Vol. 2, p. 113.

Simmons, R. T., Graydon, J. J., and Semple, N. M. (1954) : " A Blood Group Genetical Survey in Australian Aborigines," *American Journal of Physical Anthropology*, Vol. 12, p. 599.

Walsh, R. J., Kooptzoff, Olga, Dunn, Diane, and Atienza, R. Y. (1954) : " Blood Groups of Filipinos," *Oceania*, Vol. 25, p. 61.

Walsh, R. J. (1952) : " Variants of the Blood Group Gene D in Two Native Races," *Medical Journal of Australia*, Vol. 2, p. 405.

Wilson, H., Graydon, J. J., Simmons, R. T., and Bryce, Lucy M. (1944a) : " The Blood Groups of Australian Aborigines," *Medical Journal of Australia*, Vol. 2, p. 581.

Olga Kooptzoff
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THE BLOOD GROUPS OF SOME NATIVE INHABITANTS OF THE TONGAN ISLANDS

By Olga Kooptzoff and R. J. Walsh[1]

THE Tongan Islands are an archipelago of numerous islands and islets lying almost midway between Fiji and Samoa. They were visited by Abel Tasman in 1643 and by Captain James Cook in 1773. Cook again visited the islands in 1777 and spent about seven weeks there. The inhabitants are regarded as typical Polynesians, but are notable because of their high standard of intelligence. The islands became a British Protectorate under native rule in 1900.

Very few blood group studies have been undertaken on the inhabitants of the Polynesian Islands, and the only extensive survey was performed on the Maori by Simmons, Graydon, Semple and Taylor (1951). Recently Dr. Foliaki of the Vaiola Hospital, Tonga, sent blood samples from 42 male and 60 female native inhabitants of the Tongan Islands to this laboratory. The subjects ranged in age from 15 to 37 years. The results of the blood group tests performed on these samples are the subject of this report and are of interest because they differ in several respects from those obtained on the Maori.

Methods and Materials

Blood was collected with aseptic precautions from the veins of the subjects and placed in small sterile vaccine vials. No antiseptics were added and the blood was allowed to clot. The samples were forwarded to Sydney by air but were not refrigerated during transit. They were tested on the seventh day after collection and appeared to be in good condition. The methods used for testing were those described by Race and Sanger (1954) and the gene frequencies were calculated by methods used previously (Walsh, Kooptzoff, Dunn and Atienza, 1954).

Results

The ABO groups are shown in Table 1. All samples which reacted with anti A were also tested with anti A_1 serum, but no negative reactors were found. The absence of group A_2 is characteristic of the Pacific region. It is to be noted that 15·68% of all the subjects reacted with anti B serum, a finding which is to be contrasted with a complete absence of such reactions amongst the Maori (Simmons, Graydon, Semple and Taylor, 1951).

The MNS results are shown in Table 2. It can be seen that the frequency of M is high (0·5931) and comparable with that found in the Maori. On the other

[1] From the New South Wales Red Cross Blood Transfusion Service, Sydney.

hand, only 3·9% gave positive reactions with anti S, a figure which contrasts with 12·2% found by Simmons *et alii* (1951) amongst the Maori.

TABLE 1

The ABO Groups of Tongans

Group	Observed Absolute	Observed Frequency	Expected Absolute
O	46	0·4510	46·54
A_1	40	0·3922	40·47
B	11	0·1078	11·12
A_1B	5	0·0490	3·87
Total ..	102	1·0000	102·00

Gene Frequencies

O =0·6755
A_1=0·2481
B =0·0764

The Rh chromosome frequencies also differ from those observed amongst the Maori in that the frequency of R_1 is higher and that of R_2 lower. The results are

TABLE 2

The MNS Groups of Tongans

Group	Observed Absolute	Observed Frequency	Expected Absolute
MMS	1	0·0098	0·97
MsMs	36	0·3529	34·91
MNS	2	0·0196	2·04
MsNs	45	0·4412	47·19
NNS	1	0·0098	0·94
NsNs	17	0·1667	15·95
Total ..	102	1·0000	102·00

Gene Frequencies

MS=0·0081
Ms =0·5850
NS=0·0115
Ns =0·3954

shown in Table 3. Only three chromosome combinations of genes were observed, CDe(R_1), cDE(R_2) and cDe(R_0). The differences between the observed and the expected numbers are not significant.

Discussion

Ashley Montagu (1945) states that the Polynesians are essentially Mediterraneans who have "obviously undergone some admixture both with a Negroid and a Mongoloid stock; the former were probably Melanesians, the latter probably much mixed Mongoloids or people with only slightly developed Mongoloid characters." The Polynesians believe that their ancestors travelled from large islands in canoes to reach the legendary homeland called *Hawaiki*—probably the Society group of islands From *Hawaiki* they spread at a much later date throughout the geographical area of Polynesia. There is little evidence of the direction of their early movements.

TABLE 3
The Rh Groups of Tongans

Reaction with Antisera C	c	D	E	Most Common Genotype	Observed Absolute	Observed Frequency	Expected Absolute
+	—	+	—	CDe/CDe	56	0·5490	55·99
+	+	+	—	CDe/cDe	8	0·0784	8·00
+	+	+	+	CDe/cDE	36	0·3529	31·17
—	+	+	+	cDE/cDe	2	0·0196	6·56
—	+	+	—	cDe/cDe	0	0·0000	0·29
		Total ..	..	..	102	0·9999	102·01

Gene Frequencies

CDe (R_1) = 0·7409
cDE (R_2) = 0·2062
cDe (R_0) = 0·0529

An Asiatic origin has been suggested by many, including Lang (1877), but more recently Heyerdahl (1950) has demonstrated with a balsa wood raft that a movement of people could have occurred in prehistoric times from South America to Polynesia. Heyerdahl has suggested two migrations from America, the first from a hypothetical group resident in Peru and the second from ancestors of the still existent Kwakiutl tribe in British Columbia.

Some blood group frequencies of the Tongans and Maori are compared in Table 4 with those of populations which may have played a part in the ancestry of the Polynesians. A lack of homogeneity amongst the Polynesians is indicated by the fact that the Tongans differ markedly from the Maori in respect of the B, S and Rh genes. It is also evident from the ABO gene frequencies of Hawaiians and Samoans as listed by Boyd (1938). The frequency of A was 0·382 and of B 0·018 amongst the Hawaiians tested, whilst the corresponding values for the Samoans were 0·103 and 0·118 respectively.

It is obviously premature, although tempting, to speculate from the limited blood group data available on the vexed question of the origin of the Polynesians.

More blood group studies must be undertaken on American Indians and on isolated remnants of earlier inhabitants of Peru, South East Asia and Indonesia.

The data listed in Table 4 does, however, suggest the existence of gradients between New Guinea and the Maori for several blood group genes. In Figure 1

TABLE 4

Some Gene Frequencies of Populations which could be Concerned in the Origin of the Polynesians

Populations	Gene Frequencies					
	A	B	M	S	R_1	R_2
Tongans (this series)	0·2481	0·0764	0·5931	0·0196	0·7409	0·2062
Maori (Simmons, Graydon, Semple and Taylor, 1951)	0·338	0	0·525	0·062	0·465	0·486
Caucasoids — English (Ikin, Prior, Race and Taylor, 1939; Race, Mourant, Lawler and Sanger, 1948; Race and Sanger, 1954)	0·2786	0·0612	0·5303	0·3274	0·4204	0·1411
New Guinea Natives (Walsh, Kooptzoff, Lancaster and Price, 1953)	0·2434	0·1329	0·1462	0·1339	0·9153	0·0477
Fijians (Walsh and Kooptzoff, 1954)	0·2730	0·0815	0·3600	0·0356	0·8050	0·1150
Japanese (Graydon, Simmons, Heydon and Bearup, 1954; Simmons and Graydon, 1951)	0·274	0·175	0·540	—	0·702	0·277
Filipinos (Walsh, Kooptzoff, Dunn and Atienza, 1954)	0·1545	0·1582	0·5401	0·0354	0·8071	0·1095
Thais (Simmons, Graydon and Sringam, 1954)	0·180	0·249	0·650	0·085	0·820	0·130
Javanese (Simmons and Graydon, 1951)	0·178	0·180	0·632	—	0·837	0·086
Brazilian Indians (Ottensooser and Pasqualin, 1949; Pantin and Junqueira, 1952; da Silva, 1949) ..	0	0	0·896	—	0·586	0·297
Chippewa Indians (Matson and Levine, 1953)	0·064	0	0·721	0·342	0·337	0·530
Indian Veddoids (Lehmann, 1954) ..	0·257	0·182	0·736	0·313	0·667	0·158
Indian Dravidians (Lehmann, 1954) ..	0·149	0·239	0·605	0·342	0·674	0·117

the abscissa is arranged to give a straight line for the frequency of the R_1 gene amongst the New Guinea, Fijian, Tongan and Maori natives. It can be seen that the Tongans occupy an intermediate position between the Fijians and the Maori. The frequencies of three other genes are also plotted in this figure and with the

possible exception of the M gene show similiar gradients. Other island groups in the region have also been tested and confirm the existence of gradients between Melanesia and Polynesia.

Several explanations of this gradient can be advanced, but the most likely is that there has been considerable intermixing of Polynesians and Melanesians. As already mentioned, the Polynesians are noted for their seamanship and are known to have travelled long distances by raft and canoe. It is not unlikely that some Polynesians travelled in a westerly direction in the course of the general movement

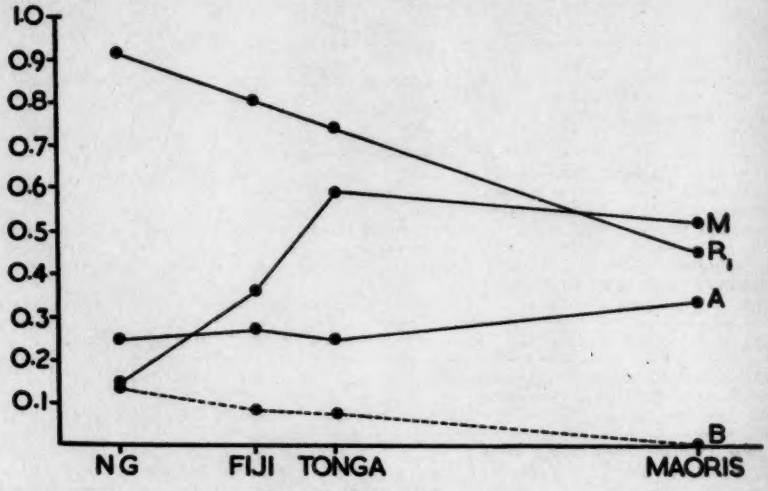

FIGURE 1

Some gene frequencies in groups possibly related to the Tongans. The abscissa has been arranged to provide a straight line for the R_1 (CDe) gene combination

from the Society Islands and either remained in parts of Melanesia or during brief visits contributed to the genetic composition of future generations. It would be surprising if the adventurous Polynesians did not undertake movements of this nature.

A graded mixture of Polynesians and Melanesians could also have occurred if Melanesians originally occupied islands in the western part of Polynesia and retreated when Polynesians advanced from the Society group. Finally, gradients would be expected if Polynesians resided in Melanesia before the arrival of the negroid Melanesians from Asia and were forced to move eastwards. This latter possibility, although unorthodox, is worthy of further consideration.

It is impossible in our present state of knowledge either to prove or to disprove any of the above hypotheses, but it is likely that further blood group surveys, both in Melanesia and in Polynesia, may help to elucidate the problem.

Summary

The ABO, MNS and Rh blood groups of some Tongan natives are reported. They differ from those found in the Maori as they have a higher frequency of the B and lower frequencies of the S and cDE(R_2) genes. The Polynesians are therefore not homogeneous throughout the geographic area known as Polynesia. Gradients of several blood group genes were observed between Melanesia and Polynesia and possible explanations are discussed.

Acknowledgements

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References

Boyd, W. C. (1939) : " Blood Groups," *Tabulæ Biologica*, Hague, Vol. 17, p. 113.

Graydon, J. J., Simmons, R. T., Heydon, G. A. M., and Bearup, A. J. (1945) : " The Rh factor and Blood Group Frequencies in Japanese," *Medical Journal of Australia*, Vol. 1, p. 601.

Heyerdahl, T. (1952) : *American Indians in the Pacific : the Theory Behind the Kon-Tiki Expedition*, London, Allen & Unwin, Chapter 16, p. 821.

Ikin, Elizabeth W., Prior, A. M., Race, R. R., and Taylor, G. L. (1939) : " The Distribution in the A_1A_2BO Blood Groups in England," *Annals of Eugenics*, London, Vol. 9, p. 409.

Lang, J. Dunmore (1877) : *Origins and Migrations of the Polynesian Nation : Demonstrating their Original Discovery and Progressive Settlement of the Continent of America* (2nd. Ed.), Samson Low, London.

Lehmann, H. (1954) : " Distribution of the Sickle Cell Gene. A New Light on the Origin of the East Africans," *Eugenics Review*, Vol. 46, p. 12 in reprint.

Matson, G. A., and Levine, P. (1953) : Personal communication, quoted by Mourant, A. E. in *The Distribution of the Human Blood Groups*, Blackwell, Oxford, 1954.

Montagu, M. F. Ashley (1947) : *An Introduction to Physical Anthropology*, 2nd. Ed., Charles Thomas, Springfield, Illinois.

Ottensooser, F., and Pasqualin, R. (1949) : " Blood Types of Brazilian Indians (Matto Grosso)," *American Journal of Human Genetics*, Vol. 1, p. 141.

Pantin, Amy M., and Junqueira P. C. (1952) : " Blood Groups of Brazilian Indians," *American Journal of Physical Anthropology*, New Series, Vol. 10, p. 395.

Race, R. R., Mourant, A. E., Lawler, Sylvia D., and Sanger, Ruth (1948) : " The Rh Chromosome Frequencies in England," *Blood*, Vol. 3, p. 689.

Race, R. R., and Sanger, Ruth (1954) : *Blood Groups in Man*, 2nd. Ed., Blackwell, Oxford.

da Silva, E. M. (1949) : " Blood Groups of Indians, Whites and White-Indian Mixtures in Southern Mato Grosso, Brazil," *American Journal of Physical Anthropology*, New Series, Vol. 7, p. 575.

Simmons, R. T., and Graydon, J. J. (1951) : " A Comparison of the Blood Groups, Sub-Groups, M-N and Rh Types found in Java with those found in other parts of Indonesia, together with a Summary of the Evidence for North-South Gradients in the Values for the Blood Genes, *q*, *m* and R^1," *Medical Journal of Australia*, Vol. 1, p. 173.

Simmons, R. T., Graydon, J. J., and Sringam, Sommai (1954) : " A Blood Group Genetical Survey in Thais, Bangkok," *American Journal of Physical Anthropology*, New Series, Vol. 12, p. 407.

Simmons, R. T., Graydon, J. J., Semple, N. M., and Taylor, C. N. D. (1951) : " Blood, Taste and Secretion : a Genetical Survey in Maoris," *Medical Journal of Australia*, Vol. 1, p. 425.

Walsh, R. J., and Kooptzoff, Olga (1954) : " Blood Groups of Some Non-Europeans in Fiji," *Oceania*, Vol. 25, p. 68.

Walsh, R. J., Kooptzoff, Olga, Dunn, Diane and Atienza, R. Y. (1954) : " Blood Groups of of Filipinos," *Oceania*, Vol. 25, p. 61.

Walsh, R. J., Kooptzoff, Olga, Lancaster, H. O., and Price, A. V. G. (1953) : " The Blood Groups of New Guinea Natives," *Oceania*, Vol. 24, p. 146.

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METRICAL CHARACTERS OF A CENTRAL AUSTRALIAN TRIBE

By A. A. Abbie[1]

Introduction

THIS paper is one of a series dealing with the general physical characters of the Njalia people. That, at least, is the title by which they were known to this expedition but there is some evidence that they are more properly called " Walpari." They are a Central Australian tribe now mainly congregated around the Government Settlement at Yuendumu, some 200 miles north-west of Alice Springs.

Previous publications on this subject have dealt with pigmentation (Abbie and Adey, 1953*a*), times of ossification (Abbie and Adey, 1953*b*) and non-metrical physical characters (Abbie and Adey, 1955). In addition, the dentition has been described by Campbell and Barrett (1953) and Barrett (1953), while Simmons, Graydon and Semple (1954) have compared the findings on blood groups, saliva and taste reactions with those of other aboriginal peoples.

The aborigines here are considered in four groups : adult males, adult females, juvenile males and juvenile females. The number of individuals recorded in any one group is not particularly large but this study has the merit of extending practically equal recognition to each of the groups and presents, therefore, a better balanced overall picture of a tribe than is usual. On the other hand, there is considerable force in the contention by Boas (1940, p. 48) that " . . . the most characteristic forms of each type are found in the adult males," so it is probable that for purely comparative purposes the figures for the adult male will prove most decisive.

The data presented here are insufficient to permit of any far-reaching conclusions, but they do establish a standard for this practically homogeneous group and this standard can be compared with that of other aboriginal groups. Up to the present the most valuable sources of comparative data are to be found in the extensive series of measurements collected by Burston (1913), Campbell, Gray and Hackett (1936) and Lloyd Warner (Howells, 1937). Howells, further, has compared Warner's data with those of most previous workers on aborigines and with figures for neighbouring and/or possibly related groups. Macintosh (1952) has recently published a limited series for south-west Arnhem Land.

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The data upon which this paper is based were collected upon an expedition conducted by the Board for Anthropological Research of the University of Adelaide. Funds for the expedition were supplied mainly by the Wenner-Gren Foundation for Anthropological Research, Incorporated, New York, and the University of Adelaide.

Material and Methods

The total number of Njalias at the settlement at the time of the visit was something over 300. Of these 106, comprising 52 males and 54 females, were examined. They were distributed as follows:

Adult males (22 to over 65 years):		
Njalia	22	
Njalia × Jumu cross (23 years)	1	
Pintubi (50 years)	1	
	—	24
Adult females (16 to over 60 years):		
Njalia		20
Juvenile males (8 months to 16 years):		
Njalia	25	
Njalia × Aranda (6 to 7 years)	1	
Njalia × Pintubi (9 years)	1	
Njalia × Aranda (12 years)	1	
	—	28
Juvenile females (3 weeks to 19 years):		
Njalia	32	
Pintubi (10 to 11 years)	1	
Pintubi (16 years)	1	
	—	34

In the subsequent analysis the crosses and aliens are separated from the Njalias, whose groups comprised, therefore, 22, 20, 25 and 32 respectively, or 99 all told.

These groups are not quite the same as those used in a previous publication (Abbie and Adey, 1955) since here one male and six females between 16 and 19 years of age are included with the juveniles, whereas formerly they were dealt with as adults. This inconsistency is due mainly to the exigencies of field work which at the time required concentration upon representative groups for X-ray examination (Abbie and Adey, 1953*b*). Consequently, these were assembled as a juvenile unit and the statistical analysis had proceeded too far to warrant changing the groupings. Since the statistical analysis is restricted to the adults in this paper it is probable that the means are not seriously affected by the omission of some of the younger members.

The ages of the subjects were determined from tradition, settlement records, general physical development and, particularly, from the dental examination conducted by Professor Campbell and Mr. Barrett. In many cases the age estimations are only very approximate, especially in the older people.

Each subject was stripped completely naked and photographed against a 10 cm. squared screen at 30 feet through a 135 mm. lens to obtain orthogonal photographic records (Plates I to IV). Close portraits in full face and profile were also taken.

Measurements were made with Martin's field anthropometry equipment in accordance with standard technique (Martin, 1928). In all, 30 measurements were made on each individual, and these are given in Tables I–IV. From the measurements 22 indices were calculated for each individual and these are shown in Tables

V–VIII. The tables on data and indices for adult males and females were subjected to statistical analysis, and this is given in Tables IX–XII. Unfortunately, in only a few age groups of the juveniles were there sufficient numbers to warrant such analysis so this has been omitted entirely until additional information is available. Meanwhile, some idea of the trends in growth can be gained from general inspection of the juvenile data and index tables.

Clearly it is not practicable, nor in the present state of knowledge particularly useful, to consider each measurement and index individually. Attention, therefore. is concentrated upon those which appear to be most significant, but all data are given here to provide both a record and a standard for comparison with other series of measurements.

Observations

General Bodily Habitus.

Stature, Adult Males. Stature ranged from 1595 to 1801 mm., with a mean of 1697·9 mm. (Tables I and IX). The Njalia × Jumu cross and the pure Pintubi show no significant difference. For more purely central Australian aborigines Spencer and Gillen (1899) give a mean of 1663 mm. While Campbell, Gray and Hackett (1936) give 1677·6 mm. The more north-western Njalias thus appear to have an advantage in mean stature of some 20 mm. or more. In the northern part of Central Australia Spencer and Gillen (1904) found a mean of 1725·2 mm. In western Arnhem Land the very mixed batch of natives measured by Burston (1913) gave a mean of 1705·95 mm., and Warner (Howells, 1937) gives means of 1696·2 and 1692·9 mm. However, in a small series (Macintosh, 1952) found a mean stature of only 1679 mm. in south-west Arnhem Land. Eastern Arnhem Land gives lower means—1669·8 and 1665 mm. (Warner). As a general figure for Arnhem Land, Billington (unpublished data) found a mean male adult stature of 1688 mm. Bathurst and Melville Islands returned a lower mean of 1668·3 mm. (Warner).

According to Howells (*loc. cit.*) the mean stature of adult males in southern and eastern Australia is about the same as that in the Centre. But from the Centre up to the north-west of Arnhem Land there appears to be a fairly progressive increase in mean stature. This increase, however, does not extend to eastern Arnhem Land, nor does it cross the few miles of water separating western Arnhem Land from Bathurst and Melville Islands. Unfortunately, there do not appear to be any reliable figures from the north-west of the continent, e.g. in the Kimberley district, to indicate whether or not this trend towards a north-western increase in stature is local or general, or just illusory.

Stature, Adult Females. These gave a range of 1493 to 1662 mm., with a mean of 1571 mm. (Tables II and XI). This is higher than the mean of 1561·96 mm. extracted from figures for 131 females (from 17 years of age on) by Campbell, Gray and Hackett (1936). Burston's (1913) figures for 30 women measured at Darwin give a mean of 1565·25 mm. and Warner (Howells, 1937) found that 69 Arnhem Land women gave a mean stature of 1575·6 mm. Thus the trend in female stature is towards that of the male.

Juveniles. In both sexes the numbers of observations for many ages are too few for statistical analysis. Inspection of Tables III and IV indicates that there is clearly an early period—up to the age of 5 years—of fairly steady and rapid growth. Between 5 and 10 years the growth rate slows down. Then it begins to accelerate again until about puberty, after which it gradually tapers off to the adult mean.

Until the end of the first 18 months the two sexes show little difference. Thereafter the female falls below the male, but keeps parallel with him until puberty. The female shows the same early adolescent spurt as the male, but evidently has attained her maximum at 16 years, while the male continues to grow until 20 years.

This follows much the same pattern as for other ethnic groups but it would be unwise to institute closer comparison until more figures are available for the aborigines.

Sitting Height. An important factor in the overall general appearance is the relation between length of trunk and length of inferior extremities. In this series the proportions were determined by measuring the sitting height, although this is possibly not as informative as the height of the top of the pubis. The individual figures are given in Tables I and II and the range and means in Tables IX and XI. Perhaps the best figure for comparison is the relative sitting height—the percentage of the total stature occupied by the trunk. For adult males this ranges from 40·8 to 49·3, with a mean of 46·13. For adult females the range is narrower: 43·4 to 49·1, but the mean slightly higher at 46·64. Martin (*loc. cit.*), giving neither source nor numbers, quoted a similar figure, of 46·4, for aboriginal males but a higher one of 48·4 for females. Campbell, Gray and Hackett (*loc. cit.*) give over 48% for both adult males and females, while the consolidated mean given by Howell (*loc. cit.* is $49 \cdot 12 \pm 0 \cdot 07$).

It is clear that the aborigines of both sexes (Plates I and III) have relatively shorter trunks and longer legs than almost every other ethnic group since hardly any cited by Martin (1928, S. 339) has a relative sitting height of less than 50 (Figure 1). Still, however, the aborigines retain to some extent the general sexual distinction of relatively shorter inferior extremities in the females.

The corresponding indices for children (Tables VII and VIII) show the expected fairly progressive fall with age in relative sitting height for both sexes, indicating how extension of the inferior extremities contributes towards the later increase in total stature. But even in quite young children the index exceeds 50 in only a few cases. Similar, though usually higher, figures are quoted by Campbell, Gray and Hackett (*loc. cit.*, Table IX) and it seems evident that this ethnic distinction of relatively very long inferior extremities is established at an early period of aboriginal growth. From general inspection (Plates II and IV) it appears that the critical age is at about 6 years in both sexes, but this needs confirmation.

Proportions of Extremities. The aborigines are distinctive not only because of the high proportion of stature contributed by the inferior extremities but also because of the segmental proportions of those extremities (Figure 1). Tables V and VI

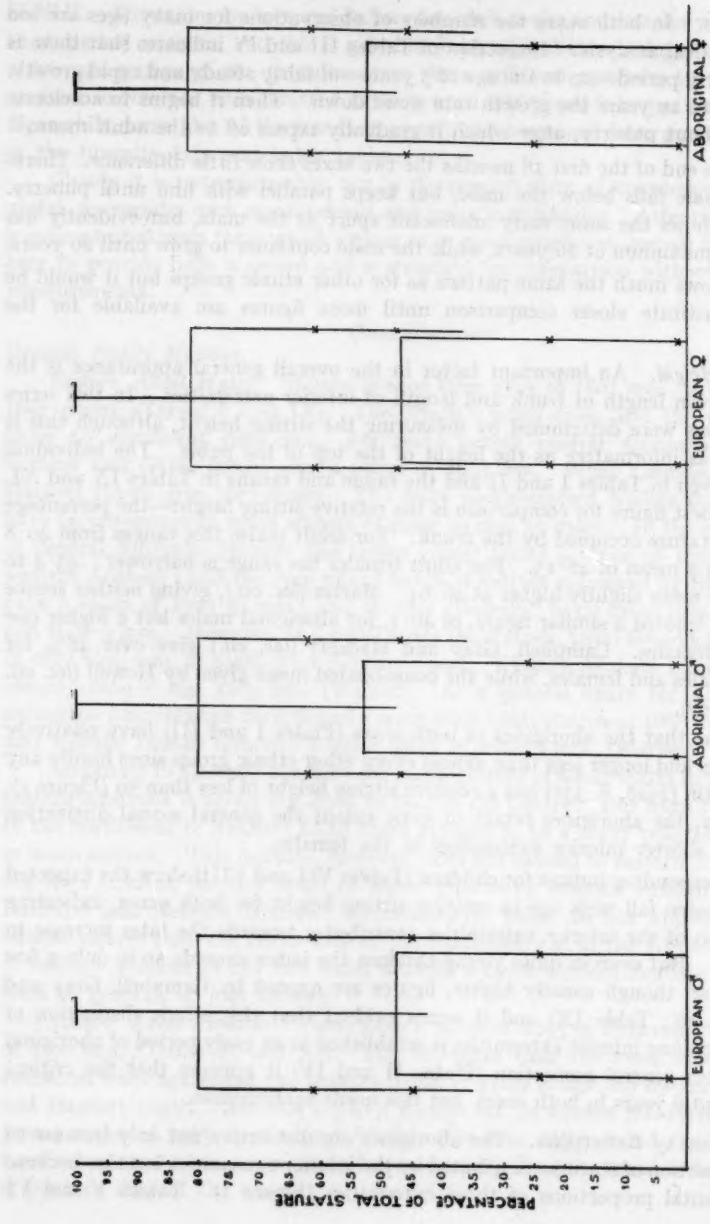
ABORIGINAL ♀
EUROPEAN ♀
ABORIGINAL ♂
EUROPEAN ♂
PERCENTAGE OF TOTAL STATURE
100 95 90 85 80 75 70 65 60 55 50 45 40 35 30 25 20 15 10 5

FIGURE 1

Relative bodily proportions of, respectively, European and Njalia males and females. The horizontal scale is the same as the vertical. European data from Martin (1928), Njalia from figures on page 223.

indicate that the tibio-femoral index is very high in both sexes, giving a mean of 88·0 for males and no less than 89·82 for females. Campbell, Gray and Hackett give closely similar figures. Thus the leg is only slightly shorter than the thigh. This feature is, if anything, more marked in females. Martin (*loc. cit.*, S. 418) gives only one higher index—90·7 for Cambodian females.

There is, evidently, a general "distal segment" exaggeration in the growth pattern, for it reappears in the superior extremities where the mean radio-humeral index is 84·51 for the male and 82·75 for the female. These figures, incidentally, are higher than those found by Campbell, Gray and Hackett for adults of the more central parts of Australia, and they are higher than any given by Martin for other peoples except Annamite females (86·7).

As with the sitting height, similar very high indices—even higher in several cases—occur throughout childhood, indicating a very early incidence for this genetic distinction. It will be noted, however (Tables V, VI, VII and VIII), that in individual cases a high radio-humeral index does not necessarily go with a high tibio-femoral index, or a low with a low. Individual variation evidently still plays a part in determining the final pattern.

Despite the fact that the radio-humeral and tibio-femoral indices are both very high in these aborigines, a glance at the inter-membral index (Tables V–VIII) discloses that the inferior extremities have an overwhelming advantage. The percentage of radius+humerus to tibia+fibula gives a mean figure of 66·25 for males and 66·33 for females. These means are lower than any given by Martin, whose figure for Australian males (quoted from Turner) is 68·7, close to that given by Campbell, Gray and Hackett. As might be expected, the inter-membral index shows a fairly progressive fall throughout the growing period (Tables VII and VIII). It is clear that despite the total exaggeration of the inferior extremity, and the relative exaggeration of the distal segments of both upper and lower extremities, the aborigine is, nevertheless, comparatively short-armed.

The general aboriginal trend towards elongation of the extremities is reflected in the measurements for hands and fingers (Tables I–IV).

Shoulders, Chest and Hips. The relative proportions of these three measurements also play a considerable part in determining the total body pattern.

Shoulder Breadth. In adult males the biacromial breadth ranged from 305 to 385 mm., with a mean of 344·5 mm. The Njalia × Jumu cross and the pure Pintubi did not differ significantly (Table IX). The relative shoulder breadth (Table X) gave a range of 17·7 to 22·5, with a mean of 20·30. For adult females the range measured was 288 to 343 mm., with a mean of 310·90 mm. (Table XI). The relative figures are 17·7 to 21·9, with a mean of 19·89 (Table XII). Children of both sexes showed a progressive increase in shoulder breadth up to the adult standard (Tables III and IV). These figures accord with those of Campbell, Gray and Hackett, both for absolute measurements and indices for both sexes. They are also in line with figures given by Warner (Howells). It is clear that the males have a fair

absolute advantage but only a slight relative advantage over the females. Comparison with other groups (see Martin, *l.c.*, S. 347 ff.) indicates that the aborigines fall among the narrower-shouldered peoples.

Chest. Adult male chest breadth ranged from 218 to 275 mm., with a mean of 247·73 mm. Here the Pintubi man was significantly narrower (Table IX). Chest depth ranged from 170 to 271 mm., with a mean of 204·43 mm. The thoracic index, calculated from the means only, came to 123·9. For adult females the respective figures (Table XI) were: breadth, 200 to 250 mm., with a mean of 221·90 mm.; depth, 150 to 220 mm., with a mean of 177·85 mm. and an index, from means only, of 123·3. Measurements on relatively small numbers of subjects gave Campbell, Gray and Hackett similar absolute measurements for both sexes and thoracic indices of the same order. Howells does not mention this figure. Comparison with Martin's tables indicates that the aborigines of both sexes are, on the average, relatively narrow-chested.

Hips. The only measurement taken in this region was the biiliac—really bicristal—diameter. For adult males (Table IX) the range was 210 to 291 mm., with a mean of 258·64 mm. For adult females (Table XI) the range was 165 to 275 mm., with a mean of 246·15 mm. Calculation from the means only gives the males a relative pelvic breadth of 15·2 and the females 15·7. There is obviously no great sexual distinction, and comparison with Martin's figures for other groups puts the aborigines decidedly in the narrow-hipped class (Figure 1).

Relation of Weight to Stature.

The weight-stature indices given in Tables V to VIII are calculated on a millimetre basis. Reduction to a centimetre basis as recommended by Martin gives, for adult males, a range of 263·6 to 427·8, with a mean of 334·6. For adult females the range is 242·6 to 390·9, with a mean of 289·2. There is a wide range but taken overall these figures are lower than those of, for example, Europeans (Martin). This lower weight per unit of stature is in accordance with all the other data emphasizing the general "linearity" of the aboriginal physical make-up.

The children (Tables VII and VIII) show a fairly progressive increase in this index with increasing age.

General Body Proportions of Adults.

It is of interest to tabulate the proportions of the body in both sexes in an effort to present a more complete picture of the physical habitus of these aborigines. In the list which follows the first three indices are means taken directly from the tables; the others have been calculated from the means.

The relative proportions of Europeans and Aborigines, based upon mean figures, are illustrated in Figure 1.

Ignoring the matter of absolute dimensions, the figures for the two sexes are extraordinarily similar; even where marked sexual distinctions should occur, e.g.

in shoulder and pelvic width, the differences in proportions are, in fact, relatively slight. It is of some interest that the Pintubi male showed significant differences from the Njalia standard in chest breadth, in length of radius and hand, and in hand breadth (Tables IX and X). However, observations restricted to one individual are inadequate for generalization, and certainly the two Pintubi girls show no peculiarities (Tables IV and VIII).

	Male.		Female.	
Stature	1697·91		1571·0	
Relative sitting height ..	46·13		46·64	
Relative shoulder breadth ..	20·3		19·9	
Humerus (%) .. .. Stature	18·5		18·6	
Radius (%) .. .. .. Stature	15·6	34·1	15·4	34·0
Hand length (%) .. .. Stature	11·0		11·4	
Femur (%) .. .. .. Stature	27·4		27·0	
Tibia (%) .. .. .. Stature	24·2	51·6	24·2	51·2
Hip breadth (%) .. .. Stature	15·2		15·7	

Head.

Cephalic Index. Head length, head breadth and cephalic index, in both males and females (Tables I and II, IX–XII), conform with figures published by many observers (see summary by Howells, 1937). Howells' figures do seem to show a slight rise in cephalic index from north to centre and south, but the difference is not marked. The present figures agree with central Australian means. It may be noted that cephalic indices are generally higher than cranial indices because of the greater thickness of the soft tissues over the sides of the skull. This usually tells more in males than in females and in this series brings the male cephalic index up to the female level (Tables X and XII). As is to be expected (Abbie, 1947) juvenile cephalic indices are generally higher than adult, and this is more marked in young females where figures over 80 were obtained. However, occasional adults of both sexes also gave an index of over 80.

The single Pintubi male showed a significantly lesser head length than the Njalias, but his cephalic index fell within the Njalia range (Tables IX and X).

Head Height. This was measured with a "head spanner" and represents, of course, only the "ear-height." It is mentioned here particularly because of the suggestion (for discussion see Howells, 1937) that the aborigines of South Australia have a significantly lesser head height than those of, particularly, the north. This could, then, be evidence of an ethnological distinction between the two groups. In the present series the range in adult male head heights is fairly large—115 to 141 mm.,

TABLE I.

Adult Yuendumu Males.

Expedition Index Number.	Approximate Age.	Weight.	Stature.	Sitting Height.	Bi-acromial Breadth.	Bi-iliac Breadth.	Chest Breadth.	Chest Depth.	Humeral Length.	Radial Length.	Hand Length.	Hand Breadth.	Index Finger Length.	Femoral Length.	Tibial Length.	Head Circumference.	Head Length.	Head Breadth.	Head Height.	Post-auricular Breadth.	Minimum Frontal Breadth.	Bi-zygomatic Breadth.	Bi-gonial Breadth.	Inter-orbital Breadth.	Trans-orbital Breadth.	Total Face Height.	Upper Face Height.	Nose Height.	Nose Breadth.	Nasal Tip Breadth.	Nasal Depth.
40	23	45·5	1726	795	350	260	250	170	310	260	201	82	92	463	363	560	200	140	139	135	100	135	75	96	26	188	144	48	40	22	29
39	25	48·2	1630	789	345	240	245	190	280	245	179	82	82	428	370	565	190	145	133	125	100	130	95	95	31	182	138	45	44	22	29
38	25	56·8	1745	805	350	240	250	190	335	275	212	82	104	478	423	560	195	140	127	125	105	125	96	96	24	194	157	44	50	22	30
41	26	55·9	1735	786	380	250	250	190	340	275	188	83	94	488	408	560	195	145	137	140	105	135	95	102	27	172	130	42	42	21	28
36	30	59·1	1727	826	340	265	260	210	320	270	204	92	104	511	412	550	185	145	130	130	105	146	116	103	33	202	160	50	52	22	31
26	35	73·2	1711	806	385	288	242	231	334	309	184	75	91	455	425	569	189	143	132	125	121	140	110	116	35	197	161	48	57	12	35
29	35	57·3	1701	830	314	268	245	190	310	250	191	81	95	449	421	540	175	145	141	128	120	135	90	100	32	190	156	43	52	16	38
35	35	49·1	1726	745	305	230	240	220	365	290	194	85	104	484	431	548	190	135	134	120	100	133	90	92	26	193	166	51	57	22	35
37	35	54·2	1663	815	325	230	240	175	305	245	186	80	103	427	340	590	200	140	127	130	100	140	105	102	26	188	153	43	56	21	30
18	40	58·6	1643	771	347	260	250	197	386	249	167	70	87	423	410	541	191	135	128	123	111	125	101	107	30	195	155	50	48	11	31
25	45	45·3	1667	762	310	245	230	190	300	250	180	84	91	411	384	540	180	140	140	120	100	131	98	93	31	191	160	45	44	21	33
31	55	66·8	1698	804	336	238	270	271	398	271	185	82	87	458	407	543	192	140	137	135	120	141	107	103	31	203	163	50	46	19	30
19	55	66·3	1716	820	351	271	218	230	313	253	177	75	95	523	402	552	180	128	126	130	115	141	100	107	29	214	174	56	45	11	37
14	55	66·4	1671	800	350	210	270	?	330	260	174	86	?	466	431	560	195	145	115	135	110	145	100	104	29	194	157	40	55	12	27
22	60	55·7	1662	747	359	272	256	158	306	235	193	91	90	520	427	548	200	140	134	?	111	139	100	106	29	197	167	51	51	17	34
17	60	62·7	1801	875	362	291	252	218	397	281	188	95	104	459	605	592	202	148	?	135	112	135	100	114	33	205	155	59	54	13	38
62	60	47·1	1657	769	345	263	240	200	300	270	188	85	90	471	397	540	180	140	121	125	100	140	90	102	24	191	165	52	49	24	33
45	60	54·1	1763	773	340	266	255	220	325	265	180	78	87	518	430	580	200	140	131	135	110	145	85	104	27	205	165	60	55	26	34
44	65	54·5	1693	753	358	270	255	230	330	265	190	83	87	479	438	540	190	135	134	130	110	140	95	102	21	192	167	49	43	25	29
21	65	67·3	1674	821	348	278	232	215	331	278	200	75	85	424	402	563	193	130	131	146	110	142	110	108	35	215	194	45	57	23	27
16	65 +	55·5	1595	650	340	280	230	180	300	250	168	90	91	436	423	550	190	140	130	120	100	140	100	94	29	210	179	38	49	22	36
Ngalia × Jumu.																															
43	22	49·1	1635	782	325	245	240	215	295	240	188	86	92	428	388	540	190	145	127	135	105	145	100	97	24	198	167	57	46	21	29
Pintubi.																															
24	30	42·7	1626	782	330	240	210	190	280	230	160	80	80	470	378	510	170	135	115	120	95	130	88	89	30	187	143	44	46	21	31

TABLE II.

Adult Yuendumu Females.

Expedition Index Number.	Approximate Age.	Weight.	Stature.	Sitting Height.	Bi-acromial Breadth.	Bi-iliac Breadth.	Chest Breadth.	Chest Depth.	Humeral Length.	Radial Length.	Hand Length.	Hand Breadth.	Index Finger Length.	Femoral Length.	Tibial Length.	Head Circumference.	Head Length.	Head Breadth.	Head Height.	Post-auricular Breadth.	Minimum Frontal Breadth.	Bi-zygomatic Breadth.	Bi-gonial Breadth.	Inter-orbital Breadth.	Trans-orbital Breadth.	Total Face Height.	Upper Face Height.	Nose Height.	Nose Breadth.	Nasal Tip Breadth.	Nasal Depth.
106	16	39·7	1590	697	343	258	210	150	280	255	173	73	85	437	398	522	180	128	126	122	105	125	78	95	21	159	133	48	44	23	30
95	18–20	48·6	1577	748	330	250	215	167	295	230	178	77	82	407	389	530	190	130	134	120	93	127	95	104	24	163	134	48	46	21	25
93	22	48·6	1570	740	330	237	220	155	300	240	177	79	82	414	398	545	190	135	134	130	110	132	90	107	24	158	123	49	44	24	29
103	25	50·7	1590	738	305	250	220	175	280	230	171	80	81	415	385	530	172	135	132	125	105	130	87	100	24	160	128	45	39	20	24
108	25	54·4	1493	730	328	270	250	200	300	250	188	76	82	417	379	525	200	142	137	130	107	130	90	110	24	165	138	47	44	24	28
110	25	50·4	1577	771	300	270	225	190	285	240	182	83	86	439	354	557	192	145	137	130	105	130	90	105	24	178	144	49	44	24	24
83	30	54·6	1624	783	391	275	240	170	320	255	171	78	86	463	392	522	180	130	136	130	105	138	85	109	24	172	136	57	45	25	26
117	30	43·2	1645	748	325	250	225	156	320	230	189	72	82	428	425	530	170	140	122	125	100	125	88	103	21	163	126	46	43	22	27
89	35	47·3	1543	705	333	248	225	190	305	230	179	81	84	400	374	545	185	130	130	125	100	125	92	107	25	165	130	41	43	21	30
104	35	48·3	1533	704	301	257	230	190	285	235	182	78	80	399	351	558	195	140	131	130	110	120	85	108	22	165	134	47	44	22	25
114	35	41·8	1509	741	300	235	205	175	260	235	172	84	76	380	358	520	180	130	127	120	97	125	90	98	23	150	121	44	44	23	26
97	40	50·0	1530	735	330	255	240	190	300	238	192	83	89	433	357	543	195	135	123	120	105	132	93	103	23	163	131	44	41	20	26
109	40	43·6	1621	740	320	250	240	195	295	265	181	75	83	453	397	530	170	135	126	125	100	130	90	94	22	165	129	45	39	21	26
113	40–45	37·7	1532	724	288	255	210	185	256	220	172	82	80	451	349	534	184	135	131	131	102	130	83	98	20	153	133	45	42	22	31
87	50	38·6	1577	685	290	243	203	180	295	245	170	73	78	453	386	525	170	135	124	125	95	125	85	99	26	174	149	44	47	22	27
88	60	39·5	1532	675	300	250	215	220	300	235	183	67	81	387	385	523	170	140	115	125	110	137	97	104	27	161	144	47	40	23	27
86	60	45·9	1560	738	310	255	220	190	300	240	191	84	82	407	377	532	190	137	122	130	105	130	85	102	24	167	137	46	41	23	26

TABLE III.

Children and Adolescent Yumdumma Males.

Expedition Index Number.	Approximate Age.	Weight.	Stature.	Sitting Height.	Bi-acromial Breadth.	Bi-iliac Breadth.	Chest Breadth.	Chest Depth.	Humeral Length.	Radial Length.	Hand Length.	Hand Breadth.	Index Finger Length.	Femoral Length.	Tibial Length.	Head Circumference.	Head Length.	Head Breadth.	Head Height.	Post-auricular Breadth.	Minimum Frontal Breadth.	Bi-zygomatic Breadth.	Bi-gonial Breadth.	Inter-orbital Breadth.	Trans-orbital Breadth.	Total Face Height.	Upper Face Height.	Nose Height.	Nose Breadth.	Nasal Tip Breadth.	Nasal Depth.
105	8/12	7·3	650	—	135	100	123	115	109	92	84	47	44	147	123	430	155	110	105	95	90	95	70	81	16	123	102	30	28	12	14
103	17/12	8·2	740		160	120	135	120	130	109	92	48	45	166	143	472	170	115	116	105	90	100	75	90	20	143	110	35	28	16	19
101	20/12	11·4	780		172	122	145	140	131	112	101	51	51	194	149	485	175	125	110	110	95	105	85	96	23	144	117	32	30	15	18
118	2	14·1	956	516	197	138	122	159	125	115	115	60	54	217	192	517	178	126	118	101	93	108	84	87	19	141	110	38	33	16	17
109	29/12	11·8	866	445	185	148	145	148	115	148	98	58	51	225	175	494	181	117	125	95	100	105	78	86	19	138	114	35	28	12	22
112	3	15·9	965	525	200	160	165	125	170	142	116	58	64	239	209	500	175	132	114	105	95	115	91	90	18	153	124	35	33	15	18
94	3	13·6	941	528	187	150	135	135	164	130	112	55	54	206	195	480	175	115	116	100	93	100	70	85	13	122	113	33	31	14	19
56	3	14·5	976	485	190	155	160	140	170	140	110	51	56	235	215	502	173	135	127	115	95	105	90	91	18	156	122	38	45	16	20
70	5/6	19·1	1137	663	240	170	175	145	200	175	138	69	63	277	235	510	180	135	125	125	100	115	86	93	23	154	125	40	40	20	17
60	6	20·9	1295	640	251	190	181	145	220	199	140	63	66	348	301	498	177	134	126	116	97	112	78	92	23	155	121	39	39	20	30
8	6/7	17·3	1170	568	240	170	175	140	205	170	132	56	60	289	255	510	175	135	123	115	95	110	85	90	21	161	120	32	33	17	24
4	7	21·8	1286	621	250	185	200	150	220	165	158	66	65	322	290	524	190	130	121	110	95	115	90	92	24	158	134	35	33	17	17
6	7	25·0	1303	606	243	205	169	230	195	146	69	67	67	309	297	508	180	135	132	115	100	120	93	99	26	159	108	38	38	18	18
9	7	22·3	1273	633	233	185	135	222	182	142	114	57	68	313	302	507	178	132	131	112	99	115	87	93	30	163	131	41	38	18	28
47	7	20·0	1255	586	230	175	190	155	230	180	144	62	68	333	286	530	190	135	125	125	100	110	98	94	24	154	121	44	35	19	21
98	7	23·6	1240	588	257	185	190	147	235	187	145	57	68	308	298	525	185	135	131	125	102	120	85	96	23	154	121	39	35	21	20
48	7/8	22·3	1326	635	257	200	200	140	230	200	148	66	77	358	288	513	170	135	128	120	100	123	93	93	20	164	137	43	40	21	24
5	8	27·3	1334	642	270	190	195	238	245	199	142	69	67	358	326	530	186	132	134	115	105	116	88	101	23	167	130	36	37	18	23
7	8	22·7	1286	624	262	182	196	151	215	175	137	52	52	325	298	485	171	130	116	110	97	118	75	90	23	158	131	35	35	8	22
3	9	29·6	1396	642	266	209	193	169	267	211	162	63	75	370	300	535	190	140	117	130	105	121	94	93	24	154	123	45	36	20	20
27	11	26·8	1348	639	251	193	190	151	238	201	144	68	68	376	321	530	192	135	131	135	100	118	88	93	24	175	146	42	35	19	22
1	11/12	35·0	1540	719	300	210	205	165	270	225	168	72	80	373	324	540	195	140	131	135	105	125	95	99	27	160	132	42	35	21	22
54	12	29·1	1439	657	298	196	190	153	261	225	152	70	73	381	360	518	193	128	138	118	97	120	85	97	25	—	34	36	18	25	
10	14	48·2	1633	800	340	250	265	170	305	260	185	87	93	407	380	570	200	140	136	120	110	132	96	113	36	190	148	44	45	22	
42	16	57·3	1740	817	370	240	260	190	340	280	208	90	95	478	431	555	195	135	134	130	100	134	106	99	28	183	138	43	44	26	30
Aranda × Ngalia.																															
59	6/7	20·9	1180	568	245	180	180	150	215	175	142	69	67	299	258	518	180	135	117	120	100	115	90	95	23	165	134	36	36	21	21
Ngalia × Pintubi.																															
2	9	23·6	1276	645	267	184	170	145	245	195	152	65	76	381	289	520	190	130	125	110	100	120	85	94	26	174	143	37	38	20	19
Aranda × Ngalia.																															
20	12	31·4	1440	665	290	215	220	165	270	230	166	73	77	400	344	535	190	135	132	120	105	130	95	101	22	169	134	44	43	20	26

TABLE IV.

Children and Adolescent Yuendumu Females.

Expedition Index Number.	Approximate Age.	Weight.	Stature.	Sitting Heigh	Bi-acromial Breadth.	Bi-iliac Breadth.	Chest Breadth.	Chest Depth.	Humeral Length.	Radial Length.	Hand Length.	Hand Breadth.	Index Finger Length.	Femoral Length.	Tibial Length.	Head Circumference.	Head Length.	Head Breadth.	Head Height.	Post-auricular Breadth.	Minimum Frontal Breadth.	Bi-zygomatic Breadth.	Bi-gonial Breadth.	Inter-orbital Breadth.	Trans-orbital Breadth.	Total Face Height.	Upper Face Height.	Nose Height.	Nose Breadth.	Nasal Tip Breadth.	Nasal Depth.
111	3/52	3·2	500	—	114	80	100	95	86	81	68	34	34	117	93	365	125	95	90	90	70	80	60	73	17	110	94	23	22	11	8
107	4/12	5·9	600	—	142	100	120	95	102	84	75	41	37	123	106	410	145	110	94	100	80	95	85	77	18	118	94	28	23	13	12
115	1	8·6	695	—	145	105	125	125	105	80	90	53	41	144	135	442	155	105	107	100	90	95	70	83	20	124	103	30	27	13	15
96	16/12	10·0	765	—	155	135	150	125	115	110	98	47	42	175	165	468	157	120	94	110	95	100	75	83	21	130	106	31	27	13	17
116	3–4	14·5	930	—	181	150	165	141	143	127	108	49	55	226	198	485	176	120	118	106	95	90	78	87	18	152	126	37	30	16	14
53	4	18·2	1063	540	230	160	170	128	182	135	105	52	52	270	260	500	168	132	122	105	98	105	70	81	18	144	123	37	34	17	22
66	5	19·1	1111	538	228	166	177	140	188	158	133	60	58	280	249	478	171	128	117	109	100	109	77	87	20	153	129	38	33	17	26
68	5	19·1	1167	570	216	168	173	132	196	162	122	65	57	288	257	491	172	120	127	108	95	108	82	89	20	155	120	38	35	17	24
67	5–6	18·1	1185	590	245	163	168	126	213	165	133	61	60	317	269	475	171	121	123	110	97	108	63	90	21	153	120	39	34	15	21
57	6	18·6	1156	560	221	176	173	130	205	171	125	55	60	304	274	494	173	131	179	111	97	114	91	89	22	143	119	33	33	18	26
72	6	19·1	1092	550	210	170	180	130	200	145	121	55	57	271	201	505	170	135	113	120	95	101	85	93	23	150	127	42	36	19	22
58	6–7	19·1	1191	596	235	175	171	139	205	189	135	57	59	309	275	515	181	131	128	115	100	108	71	93	21	157	135	37	36	17	27
64	7	23·2	1239	604	248	188	188	153	230	180	133	60	59	324	298	528	179	129	119	123	105	118	82	96	23	153	125	35	36	19	20
65	7	22·7	1277	645	260	182	169	140	205	179	130	57	58	351	286	498	172	122	118	115	95	109	83	93	21	153	128	37	41	19	27
73	7	20·0	1135	568	220	—	175	140	190	170	131	60	59	380	264	490	175	130	118	110	95	105	80	94	22	152	120	34	32	18	15
74	7	23·2	1321	655	240	195	170	130	215	185	152	68	70	317	295	498	170	135	117	125	98	115	80	98	27	157	127	42	35	17	21
51	8	24·5	1265	627	259	152	171	145	201	171	142	63	71	330	274	518	176	130	133	122	99	—	—	93	23	154	130	37	36	19	19
69	8	20·0	1216	580	241	169	170	122	210	171	128	64	60	325	268	476	170	122	125	117	97	108	75	92	23	150	122	37	34	17	25
52	8–9	23·2	1281	650	250	191	178	135	208	185	148	63	64	321	295	488	175	130	129	115	98	117	78	90	24	163	133	36	33	15	22
61	8–9	21·4	1213	590	260	190	173	130	225	173	141	72	68	315	281	510	175	135	127	122	98	115	90	96	22	137	103	37	38	20	22
99	9	18·2	1226	603	250	177	165	130	230	190	148	61	60	310	299	495	175	130	127	117	95	115	95	96	22	146	117	37	38	17	19
49	10–11	30·0	1446	664	276	215	195	152	270	224	166	73	77	397	356	488	177	135	126	125	97	118	91	95	25	161	130	36	34	17	27
71	13	32·7	1434	688	380	225	185	150	262	225	168	78	81	380	356	512	175	140	125	115	105	125	95	120	27	160	128	45	43	19	24
80	14	37·3	1481	678	300	210	210	165	290	250	175	75	81	411	381	533	165	140	126	135	100	120	90	99	22	168	132	46	36	20	26
85	14	32·3	1531	711	298	232	207	168	295	233	173	81	80	431	379	519	182	131	130	125	105	123	82	93	23	175	143	43	40	21	28
79	14+	35·9	1559	718	290	230	200	150	300	245	179	74	79	430	379	525	175	135	128	125	100	120	80	98	22	163	131	47	43	22	25
84	15	46·6	1587	729	314	223	240	173	297	245	175	74	85	478	358	527	180	132	129	129	108	131	95	101	22	159	136	41	43	22	30
77	16	46·8	1606	715	335	230	230	160	320	260	197	88	96	441	395	567	200	136	122	130	100	130	95	104	24	175	135	49	42	21	26
78	16	46·4	1599	762	330	235	225	170	300	240	185	83	91	436	409	540	185	135	126	125	100	125	90	100	23	166	140	43	39	20	21
91	17	43·6	1664	778	320	240	215	145	330	252	182	78	88	428	399	530	180	135	134	120	100	125	90	103	23	160	124	46	46	26	30
76	18	50·5	1523	730	310	255	215	170	295	230	178	82	80	397	363	532	185	135	129	115	100	125	95	101	26	172	138	44	39	22	25
82	19+	68·2	1594	768	315	245	240	170	315	265	186	78	83	434	399	542	190	135	126	125	100	130	100	101	28	168	132	45	30	23	22
Pintubi.																															
50	10–11	25·5	1341	613	261	175	177	143	231	198	143	61	63	372	339	498	172	128	136	115	98	106	84	97	24	145	113	35	28	15	20
75	16	41·8	1560	764	310	235	230	157	295	238	173	78	80	457	385	535	170	135	121	125	100	123	92	94	23	168	131	43	40	22	24

TABLE V.

Adult Yendumu Males Indices.

Expedition Index Number.	Approximate Age.	Weight-Stature.	Humero-Radial.	Tibio-Femoral.	Intermembral II.	Hand.	Palmar.	Relative Shoulder Breadth.	Relative Sitting Height A.	Cephalic.	Cranial Module.	Cephalic Length-Height.	Cephalic Breadth-Height.	Fronto-Parietal.	Cephalo-Facial.	Zygo-Frontal.	Zygo-Gonial.	Fronto-Gonial.	Facial.	Upper Facial.	Nasal A.	Nasal B.	Tip-Alar.
40	23	2636	83·9	78·4	69·0	45·8	75·2	20·3	46·1	70·0	479	69·5	99·3	71·4	96·4	74·1	55·6	73·0	139·3	106·7	83·3	72·5	55·0
39	25	2957	87·5	86·4	65·8	43·8	80·3	21·8	47·8	76·3	458	64·7	84·8	69·0	89·7	76·9	73·1	93·0	140·0	106·2	97·8	65·9	50·0
38	25	3255	84·1	88·5	65·6	39·2	78·9	22·0	45·1	71·8	462	63·1	90·7	75·0	89·3	84·0	76·8	91·4	155·2	115·6	113·6	66·0	44·0
41	26	3341	80·9	83·6	68·6	44·2	80·3	23·0	45·6	70·3	477	70·3	94·5	72·4	93·1	77·8	70·4	90·5	127·4	111·1	100·0	66·7	50·0
36	30	3422	84·4	80·6	63·9	45·1	80·7	19·7	45·6	78·4	460	69·8	89·2	72·4	100·7	71·9	79·5	110·5	138·4	109·5	104·0	59·6	42·3
26	35	3278	92·5	93·4	73·1	40·8	80·7	23·7	47·1	75·7	464	69·8	84·6	84·6	97·9	86·4	78·6	90·9	140·7	115·0	94·1	68·6	23·5
29	35	3369	80·6	93·8	74·4	31·8	83·9	18·5	47·3	82·9	461	80·6	97·2	82·8	93·1	88·9	66·7	73·0	140·7	115·6	82·7	73·1	30·8
33	35	3243	89·3	89·0	72·0	43·0	83·5	17·7	44·5	71·1	457	69·5	97·8	74·1	98·5	75·2	67·7	90·0	143·1	124·8	100·0	68·6	43·1
35	35	3375	89·4	91·0	64·2	43·0	87·5	21·3	46·0	70·0	467	63·5	90·7	71·4	100·0	71·4	75·0	103·0	134·3	109·3	130·2	53·6	37·5
37	40	3628	87·1	96·9	69·8	46·7	94·4	21·3	46·8	70·7	454	67·0	94·8	82·2	92·6	89·5	80·8	91·0	156·0	124·0	96·0	64·6	28·9
28	45	3793	85·3	88·4	69·8	44·3	91·7	19·0	46·8	77·8	460	77·8	100·0	71·4	93·6	76·3	74·8	98·0	143·8	122·1	97·8	75·0	47·7
31	55	3934	86·8	89·4	66·8	44·3	94·4	19·8	47·8	72·9	459	66·2	90·7	85·7	100·7	85·1	75·9	89·2	143·9	115·6	92·0	65·2	41·3
19	55	3531	78·8	76·9	66·8	40·4	91·5	20·5	47·8	71·1	434	70·0	98·4	89·8	110·2	81·6	70·9	87·0	151·8	123·4	80·4	82·2	24·4
24	55	3974	84·1	86·8	64·3	40·4	97·9	20·4	47·9	74·4	435	59·0	79·3	75·9	100·0	75·9	69·0	90·9	133·8	108·3	137·5	49·1	21·4
22	60	3181	84·6	92·4	68·5	43·5	98·5	20·4	48·1	70·0	474	67·0	93·7	75·7	91·2	79·9	71·9	89·3	141·7	120·1	100·0	66·7	33·3
17	60+	3429	84·0	84·3	65·7	45·2	86·7	20·8	46·1	77·8	441	67·2	86·4	71·4	100·0	71·4	64·3	90·0	136·4	117·8	94·2	65·3	49·0
64	60+	3269	85·1	83·2	63·8	43·2	79·1	19·3	43·9	70·0	471	65·5	93·6	78·6	103·6	75·9	58·6	77·3	141·4	113·8	91·7	61·8	47·3
43	60+	3210	80·3	83·2	67·1	43·2	83·9	20·7	44·5	71·1	449	65·3	91·9	81·5	103·7	78·6	67·9	86·4	137·1	119·3	87·8	67·4	38·1
44	65	3256	86·3	89·7	66·5	39·0	86·1	19·8	46·1	72·2	478	69·2	95·8	82·5	104·2	79·2	74·5	94·1	138·9	114·9	112·8	30·9	43·4
48	65	3568	84·8	91·8	63·3	39·5	71·4	20·5	47·9	67·4	454	67·9	100·8	84·6	109·2	77·5	77·5	100·0	151·4	136·6	117·8	78·4	22·8
21	65	3542	83·3	97·0	64·0	33·6	118·2	21·3	40·8	73·7	460	68·4	92·9	71·4	100·0	71·4	71·4	100·0	150·0	127·9	84·5	73·5	44·9
16	65+																						
											Ngalia × Jumu.												
43	22	3003	81·0	90·7	65·6	45·7	89·6	19·9	47·8	76·3	462	66·8	87·6	72·4	100·0	72·4	69·0	95·2	136·6	115·2	90·2	63·0	45·7
24	50	2626	82·1	80·4	60·1	37·5	75·0	21·5	48·1	79·4	420	67·6	85·2	70·4	96·3	73·1	67·7	92·6	143·8	120·0	104·6	67·4	45·6

TABLE VI.

Adult Yuendumu Females Indices.

Expedition Index Number.	Approximate Age.	Weight-Stature.	Humero-Radial.	Tibio-Femoral.	Intermembral II.	Hand.	Palmar.	Relative Shoulder Breadth.	Relative Sitting Height A.	Cephalic.	Cranial Module.	Cephalic Length-Height.	Cephalic Breadth-Height.	Fronto-Parietal.	Cephalo-Facial.	Zygo-Frontal.	Zygo-Gonial.	Fronto-Gonial.	Facial.	Upper Facial.	Nasal A.	Nasal B.	Tip-Alar.
106	16	2460	91·1	93·2	64·8	42·2	82·8	21·6	43·8	71·1	434	70·0	98·4	82·0	97·7	84·0	62·4	74·3	127·2	106·4	91·7	68·2	52·3
95	18–20	2594	88·4	93·8	67·5	43·3	81·9	19·0	48·7	68·4	454	70·5	103·1	71·5	97·7	73·2	74·8	97·9	128·3	105·5	95·8	54·4	45·6
93	20	3096	83·4	93·2	67·4	44·6	83·2	21·0	47·2	71·1	459	70·5	99·3	81·5	97·8	83·3	68·2	81·8	119·7	107·3	89·8	65·9	54·6
93	21	2426	83·3	92·8	65·0	46·5	85·1	19·7	47·1	78·5	439	76·7	97·8	74·1	96·3	76·9	61·5	80·0	123·1	98·5	86·7	61·5	51·3
102	25	2850	82·1	86·6	65·6	43·3	82·2	20·1	47·4	69·2	459	66·2	95·6	77·8	88·9	87·5	72·5	82·9	137·5	115·0	75·5	70·0	50·0
108	25	3462	83·3	92·2	69·6	40·3	71·7	20·8	47·6	71·0	469	63·5	89·4	75·4	91·6	83·3	69·2	84·1	124·6	98·5	93·6	63·6	54·6
110	25	3229	84·3	80·6	66·2	45·6	86·5	18·8	48·4	75·5	464	66·2	87·6	72·4	89·7	80·8	69·2	85·7	136·9	110·8	89·8	30·0	54·6
83	30	3100	79·7	84·7	60·9	45·6	83·0	17·7	47·7	72·2	436	70·0	96·9	86·9	103·9	83·7	68·2	81·4	123·0	106·7	100·0	37·8	46·7
117	30	2623	81·3	86·6	63·3	38·3	75·0	19·7	46·8	77·8	449	71·7	92·1	75·0	98·6	76·1	61·6	81·0	124·7	98·6	84·2	36·3	52·1
89	35	2626	71·9	99·3	64·5	42·8	76·4	21·0	45·1	82·4	432	71·8	87·1	70·0	92·9	75·4	67·2	89·8	125·4	96·9	93·5	46·5	51·2
104	35	3108	82·0	93·5	71·7	45·3	85·3	21·9	46·3	70·3	435	64·9	94·3	76·9	96·2	80·0	73·6	92·0	133·0	104·0	104·9	69·8	48·8
114	35	3144	84·5	87·9	69·3	42·9	75·5	19·9	45·9	71·8	466	67·2	93·6	78·6	85·7	91·7	70·8	77·3	137·5	111·7	93·6	56·8	50·0
90	35+	2770	86·5	94·2	65·7	46·8	87·5	19·9	49·1	72·2	437	70·6	97·7	74·6	96·2	77·6	72·9	92·8	130·0	96·6	100·0	59·1	52·3
97	35+	2618	84·8	91·1	67·0	42·8	76·2	18·6	46·1	70·3	432	63·2	90·0	76·9	96·2	80·0	64·0	80·0	132·0	107·2	84·4	55·3	55·3
100	40	3268	79·3	82·4	68·1	43·2	80·6	21·6	48·0	69·2	453	63·1	91·1	77·8	97·8	79·6	70·5	88·6	133·5	99·2	93·2	63·4	48·8
113	40	2942	80·0	92·6	68·9	44·0	77·1	19·9	46·7	72·1	449	64·2	89·1	76·6	94·9	80·8	65·4	81·0	128·5	105·4	89·1	63·4	56·1
81	40–45	2689	89·8	87·6	65·9	41·4	76·5	19·7	45·7	79·4	431	74·1	93·3	74·1	96·3	76·9	69·2	90·0	126·9	99·2	86·7	66·7	53·9
87	50++	2461	85·9	77·4	59·5	47·7	89·1	18·8	47·1	73·4	450	71·2	97·0	75·6	96·3	78·5	63·9	81·4	117·7	102·3	93·3	73·8	52·4
88	60++	2448	83·1	85·2	64·4	42·9	79·3	18·4	43·4	79·4	439	72·9	91·9	70·4	93·6	76·0	68·0	89·5	139·2	119·2	106·8	57·5	46·8
86	60+	3909	78·3	99·5	69·3	36·7	65·7	19·7	44·4	82·4	425	67·7	83·1	78·6	97·9	80·3	70·8	88·2	117·5	105·1	85·1	67·5	57·5

TABLE VII.

Children and Adolescent Yuendumu Males Indices.

Expedition Index Number.	Approximate Age.	Weight-Stature.	Humero-Radial.	Tibio-Femoral.	Intermembral II.	Hand.	Palmar.	Relative Shoulder Breadth.	Relative Sitting Height A.	Cephalic.	Cranial Module.	Cephalic Length-Height.	Cephalic Breadth-Height.	Fronto-Parietal.	Cephalo-Facial.	Zygo-Frontal.	Zygo-Gonial.	Fronto-Gonial.	Facial.	Upper Facial.	Nasal A.	Nasal B.	Tip-Alar.
105	8/12	1119	84·4	83·7	74·4	56·0	117·5	20·8	—	71·0	370	67·7	95·5	81·8	86·4	94·7	73·7	77·8	129·5	107·4	93·3	50·0	42·9
103	17/12	1108	83·9	86·1	77·3	52·3	102·1	21·6	—	67·7	401	68·2	100·9	73·8	87·0	90·0	73·0	83·3	143·0	110·0	86·0	67·9	57·1
101	20/12	1462	85·5	76·8	70·8	50·5	98·0	22·1	—	71·4	410	62·9	88·0	74·0	84·0	90·5	81·0	89·5	137·1	111·4	93·4	40·0	50·0
118	2	1475	78·6	88·5	69·4	50·3	98·4	20·6	54·0	70·8	422	66·3	93·7	73·8	85·7	86·1	77·8	90·3	130·6	101·9	86·8	51·5	48·5
109	23/12	1361	77·7	77·8	65·8	52·2	102·0	21·4	54·4	71·4	421	65·1	86·4	72·0	87·1	82·6	79·1	95·8	133·0	107·8	94·3	54·6	45·5
112	3	1648	83·5	87·4	69·6	50·0	111·0	20·8	56·1	68·7	406	66·3	100·9	80·9	87·0	93·0	75·3	93·0	122·0	113·0	93·9	61·3	45·2
94	3	1445	79·3	94·7	73·3	49·2	94·8	19·3	49·7	78·0	423	73·4	94·1	70·4	77·8	90·5	85·7	94·7	148·6	116·2	118·4	44·4	35·6
56	3	1485	82·4	91·5	70·5	50·0	94·4	21·1	49·5	75·0	440	69·4	92·6	74·1	85·2	87·0	73·9	85·0	133·9	108·7	82·5	51·5	60·6
70	5	1880	87·5	92·1	70·6	50·0	85·1	19·4	49·4	73·7	437	71·2	94·0	72·4	83·6	86·6	69·6	86·4	138·4	108·0	94·9	81·1	54·1
60	6	1614	90·5	88·6	64·1	45·4	77·8	20·5	48·6	77·1	433	70·3	91·1	70·4	81·5	86·4	77·3	89·5	146·4	109·1	109·1	68·6	48·6
8	6–7	1471	82·9	88·0	67·8	44·8	90·4	19·7	49·1	68·4	441	63·7	93·1	73·1	88·5	82·6	78·3	94·7	137·4	116·5	94·3	51·5	51·5
4	7	1722	84·1	96·1	70·1	47·3	87·3	18·6	46·5	73·0	447	73·3	97·8	74·1	88·9	83·3	77·5	93·0	115·8	90·0	100·0	47·4	47·4
6	7	1919	84·8	96·1	66·8	46·1	77·3	19·9	49·8	74·2	422	73·6	99·2	73·0	87·1	86·1	75·7	87·9	141·7	113·9	92·7	53·7	26·3
9	7	1752	78·3	86·5	66·2	43·1	81·6	19·9	46·7	71·1	450	65·8	92·6	74·1	81·5	90·9	89·1	98·0	140·0	110·0	79·6	60·0	54·3
47	7	1594	79·0	96·5	69·6	39·3	74·0	20·7	47·4	73·0	451	70·1	97·0	73·6	88·9	85·9	70·8	83·3	128·3	100·8	89·7	57·1	60·0
98	7–8	1583	80·4	80·5	60·5	44·6	93·0	19·4	47·9	79·4	433	75·3	94·8	74·1	91·1	81·3	75·6	93·0	133·3	111·4	93·0	60·0	52·5
48	7–8	2012	81·2	91·4	64·9	48·6	94·5	20·0	47·4	71·0	452	72·0	101·5	79·6	87·9	90·5	75·9	83·3	144·0	112·1	102·8	62·2	48·7
5	8	1709	81·4	91·4	63·4	38·0	61·2	20·7	49·3	76·0	417	67·8	89·2	74·6	90·8	82·2	63·6	77·3	134·0	111·0	100·0	62·9	22·9
7	8	2793	79·0	81·7	71·3	38·9	72·4	19·1	46·0	73·7	447	61·6	90·0	80·8	93·1	86·8	77·7	89·5	127·3	93·4	80·0	55·6	55·6
3	9	2730	84·5	85·4	63·0	47·2	89·5	18·7	47·6	70·3	458	68·2	97·0	74·1	87·4	84·8	74·6	88·0	148·3	123·7	83·3	82·9	54·3
27	11	1997	83·3	86·9	71·0	42·9	81·8	20·7	48·9	71·8	466	67·2	93·6	75·0	89·3	84·0	76·0	90·5	128·0	105·6	83·3	62·9	42·9
1	11–12	2445	84·3	86·9	71·0	42·9	81·8	20·7	48·9	71·8	466	67·2	93·6	75·0	89·3	84·0	76·0	90·5	128·0	—	83·3	69·4	50·0
54	12	2026	85·9	92·1	64·2	46·1	88·6	20·8	45·8	66·3	459	71·5	107·8	73·8	93·8	80·8	70·8	87·6	—	105·9	69·4	48·9	57·8
10	14	2935	85·2	93·4	71·8	47·0	91·6	20·8	49·0	70·0	476	68·0	97·1	78·6	94·3	83·3	72·7	87·3	143·9	112·1	102·3	48·9	57·8
42	16	3393	84·2	90·2	68·2	43·3	79·7	21·3	47·0	69·2	464	68·7	99·3	74·1	99·3	74·6	79·1	106·0	136·6	103·0	97·7	71·4	52·4
Aranda × Ngalia.																							
59	6–7	1771	81·4	86·3	70·0	48·6	92·0	20·8	48·1	73·0	432	65·0	86·7	74·1	85·2	87·0	79·0	90·0	147·8	116·5	100·0	58·3	58·3
Ngalia × Pintubi.																							
2	9	1850	79·6	75·9	65·7	42·8	85·5	20·9	50·5	68·4	445	65·8	96·2	76·9	92·3	83·3	70·9	70·9	145·0	117·5	102·7	50·0	52·6
Aranda × Ngalia.																							
20	12	2181	85·2	86·0	67·2	43·9	82·0	20·1	46·2	71·1	457	69·5	97·8	77·8	96·3	80·8	73·1	73·1	130·0	103·1	97·7	60·5	46·5

20	12	2181	85·2	86·0	67·2	43·9	82·0	20·1	46·2	71·1	457	69·5	97·8	77·8	96·3	80·8	73·1	73·1	130·0	103·1	97·7	60·5	46·5

TABLE VIII.

Children and Adolescent Yuendumu Females Indices.

Expedition Index Number.	Approximate Age.	Weight-Stature.	Humero-Radial.	Tibio-Femoral.	Intermembral II.	Hand.	Palmar.	Relative Shoulder Breadth.	Relative Sitting Height A.	Cephalic.	Cranial Module.	Cephalic Length-Height.	Cephalic Breadth-Height.	Fronto-Parietal.	Cephalo-Facial.	Zygo-Frontal.	Zygo-Gonial.	Fronto-Gonial.	Facial.	Upper Facial.	Nasal A.	Nasal B.	Tip-Alar.
111	3/52	640	94·2	79·5	79·8	50·0	100·0	22·8	—	76·0	310	72·0	94·7	73·7	84·2	87·5	75·0	85·7	137·5	117·5	95·7	36·4	50·0
107	4/12	955	82·4	86·2	81·2	54·7	107·9	22·9	—	75·9	349	64·8	85·5	72·7	86·4	84·2	89·5	106·3	124·2	99·0	82·1	52·2	56·5
115	1	1237	76·2	93·8	66·3	58·9	110·4	20·9	—	67·7	367	69·0	101·9	85·7	90·5	94·7	73·7	77·8	120·0	108·4	90·0	55·6	48·2
96	16/12	1323	95·7	94·3	66·2	48·0	83·9	20·3	—	76·4	371	59·9	78·3	79·2	83·3	95·0	75·0	79·0	130·0	106·0	87·1	63·0	48·2
116	3–4	1559	88·8	87·6	63·7	45·4	92·5	19·5	—	68·2	414	67·1	98·3	79·2	75·0	105·6	86·7	82·1	168·9	140·0	81·1	46·7	53·3
53	4	1712	74·2	96·3	57·9	49·5	98·1	21·6	50·8	78·6	422	72·6	92·4	74·2	79·6	93·3	66·7	71·4	137·1	117·1	91·9	64·7	50·0
66	5	1719	84·0	88·9	65·4	45·1	80·9	20·5	48·4	74·9	416	68·4	81·4	78·1	85·2	91·7	70·6	77·0	140·4	118·4	86·8	78·8	51·5
68	5	1637	82·7	89·2	65·7	53·3	100·0	18·5	48·8	69·8	419	73·8	105·8	79·2	90·0	88·0	75·9	86·3	143·5	111·1	92·1	68·6	48·6
67	5–6	1527	77·5	84·9	64·5	45·9	83·6	20·7	49·8	70·8	415	71·9	101·7	80·2	89·3	89·8	58·3	65·0	141·7	111·1	87·2	61·8	44·1
57	6	1609	83·4	90·1	65·1	44·0	84·6	19·1	48·4	75·7	433	74·6	98·5	73·5	87·0	85·1	79·8	93·8	124·6	104·4	100·0	78·8	54·6
72	6	1749	72·5	74·2	73·1	45·5	85·9	19·2	50·4	79·4	418	66·3	83·7	70·4	74·8	94·1	84·2	89·5	148·5	125·7	85·7	61·1	52·8
58	6–7	1604	92·2	89·0	67·5	42·2	75·0	19·7	50·0	72·4	440	70·7	97·7	76·3	82·4	92·6	65·7	71·0	145·4	125·0	97·3	75·0	47·2
64	7	1872	78·3	92·0	65·9	45·1	81·1	20·0	48·7	72·1	427	66·5	92·3	81·4	91·5	89·0	69·5	78·1	129·7	105·9	102·9	55·6	52·8
65	7	1778	87·3	81·5	60·3	43·9	79·2	20·4	50·5	70·9	412	68·6	96·7	77·9	89·3	87·2	76·2	87·4	140·4	117·4	110·8	65·9	46·3
73	7	1762	89·5	94·3	66·2	45·8	83·3	19·4	50·0	74·3	423	67·4	90·8	73·1	80·8	90·5	76·2	84·2	144·8	114·3	94·1	46·9	56·3
74	7	1756	86·1	93·1	65·4	44·7	82·9	18·2	49·6	79·4	422	68·8	86·7	72·6	85·2	85·2	69·6	81·6	136·5	110·4	83·3	60·0	48·6
51	8	1937	85·1	83·0	61·6	44·4	88·7	20·5	49·6	73·9	439	75·6	102·3	76·2	—	—	—	—	—	—	97·3	52·8	52·8
69	8	1628	81·4	82·3	64·3	50·0	94·1	19·8	47·7	71·8	417	73·5	102·5	79·5	88·5	89·8	69·5	77·3	138·9	113·0	91·9	73·5	50·0
52	8–9	1811	88·9	91·9	63·8	42·6	75·0	19·3	50·7	74·3	434	73·7	99·2	75·4	90·0	83·8	66·7	79·6	139·3	113·7	91·7	66·7	45·5
61	8–9	1764	76·9	89·2	66·8	51·1	98·6	21·4	48·6	77·1	437	72·6	94·1	72·6	85·2	85·2	78·3	91·8	119·0	89·6	102·7	57·9	52·6
99	9	1485	82·6	96·5	69·0	41·2	69·3	20·3	49·4	74·3	432	72·6	97·7	73·1	88·3	82·6	82·6	100·0	127·0	101·7	102·7	50·0	44·7
49	10–11	2075	83·0	89·7	65·6	44·0	82·0	19·1	45·9	76·3	438	71·2	93·3	71·9	87·4	82·2	77·1	93·8	136·4	110·2	94·4	79·4	50·0
71	13	2280	84·9	93·7	66·6	46·4	89·7	19·5	48·0	80·0	440	71·4	89·3	75·0	89·3	84·0	76·0	90·5	128·0	102·4	95·6	55·8	44·2
80	14	2519	86·3	92·7	68·2	42·9	79·8	20·3	45·8	84·9	431	76·4	90·0	71·4	85·7	83·3	75·0	90·0	140·0	110·0	78·3	72·2	55·6
85	14	2110	79·0	87·9	65·2	46·8	87·1	19·5	46·4	72·0	443	71·4	99·2	80·2	93·9	85·4	66·7	78·1	142·3	116·3	93·0	70·0	52·5
79	14+	2303	81·7	92·3	65·9	41·3	74·0	18·6	46·1	77·1	438	73·1	94·8	74·1	88·9	83·3	66·7	80·0	135·8	109·2	91·5	58·1	51·2
84	15	2936	82·5	74·9	64·8	42·3	82·2	19·8	45·9	73·3	441	71·7	97·7	81·8	99·2	82·4	72·5	88·0	121·4	103·8	104·9	69·8	51·2
77	16	2914	81·3	89·6	69·4	44·7	87·1	20·9	44·5	68·0	458	61·0	89·7	73·5	95·6	76·9	73·1	95·0	134·6	103·9	85·7	61·9	50·0
78	16	2912	80·0	93·8	63·9	44·9	88·3	20·6	47·7	73·0	446	68·1	93·3	74·1	92·6	80·0	72·0	90·0	132·0	112·0	90·7	53·9	51·3
91	17	2620	76·4	93·2	70·4	42·9	83·0	19·2	46·2	75·0	449	74·4	99·3	74·1	92·6	80·0	72·0	90·0	128·0	99·2	100·0	65·2	56·5
76	18	3447	78·0	91·4	69·1	46·1	83·7	20·4	47·9	73·0	449	70·1	95·6	74·1	92·6	80·1	76·0	95·0	137·6	110·4	88·6	64·1	56·4
82	19+	4279	84·1	91·9	69·6	41·9	75·7	19·8	48·2	71·1	451	66·3	93·3	74·1	96·3	76·0	76·9	100·0	129·2	101·5	88·9	55·0	57·5
Pintubi.																							
50	10–11	1902	85·7	91·1	60·3	42·7	76·3	19·5	45·7	74·4	436	79·1	106·3	76·6	82·8	92·5	79·3	85·7	136·8	106·6	108·6	52·6	39·5
75	16	2680	79·7	84·2	62·9	45·1	83·9	19·9	49·0	79·4	426	71·2	89·6	74·1	91·1	81·3	74·8	92·0	136·6	106·5	93·0	60·0	55·0

with a mean of 130·1 mm. (Table IX). This range extends from almost the lowest ever recorded for South Australia (114·67 mm., Campbell and Lewis, 1926) to well up towards the highest recorded anywhere in Australia. The adult female figures actually fall within the male range. The wide range could reflect some intermingling on the boundary of two groups but for the fact that Campbell, Gray and Hackett (1936) have shown that there is no evidence of admixture in the Centre.

TABLE IX.

Adult Males: Statistical Analysis of Data.

Character.	n Number Observed.	Range.	x Mean.	S.D. Standard Deviation.	S.D. x Standard Error of Mean.	Njalia × Jumu One Observation		Pintubi One Observation	
Weight	22	45·5–73·2	56·71	7·0759	1·5086	49·1	t=1·05*	42·7	t=1·94*
Stature	22	1595–1801	1697·91	55·1870	11·7659	1635	t=1·11*	1626	t=1·27*
Sitting height ..	22	650–920	792·45	51·4214	10·9631	782	t=0·20*	782	t=0·20*
Bi-acromial breadth ..	22	305–385	344·50	18·9831	4·0472	325	t=1·00*	350	t=0·28*
Bi-iliac breadth	22	210–291	258·64	18·0727	3·8531	245	t=0·74*	240	t=1·01*
Chest breadth ..	22	218–275	247·73	14·8618	3·1686	240	t=0·51*	210	t=2·48†
Chest depth ..	21	170–271	204·43	23·3229	5·0895	215	t=0·44*	190	t=0·60*
Humeral length	22	280–365	313·73	19·9695	4·2575	295	t=0·92*	280	t=1·65*
Radial length ..	22	245–281	264·68	16·1669	3·4468	240	t=1·49*	230	t=2·10†
Hand length ..	22	167–201	186·41	11·2870	2·4064	188	t=0·14*	160	t=2·29†
Hand breadth	22	70–95	81·55	7·6141	1·6233	86	t=0·57*	60	t=2·77†
Index finger length ..	21	82–104	92·67	7·2480	1·5816	92	t=0·09*	80	t=1·71*
Femoral length	22	411–523	465·73	33·2053	7·0794	428	t=1·11*	470	t=0·13*
Tibial length ..	22	340–468	411·09	28·4386	6·0631	388	t=0·79*	378	t=1·14*
Head circumference ..	22	540–605	557·45	17·0426	3·6335	540	t=1·00*	510	t=2·72†
Head length ..	22	175–202	191·36	7·5816	1·6164	190	t=0·18*	170	t=2·76†
Head breadth ..	22	128–148	140·09	5·0039	1·0668	145	t=0·96*	135	t=0·99*
Head height ..	21	115–141	130·10	6·5719	1·4341	127	t=0·46*	115	t=2·24†
Post-auricular breadth ..	22	120–146	130·27	7·2452	1·5447	135	t=0·64*	120	t=1·39*
Minimum frontal breadth ..	22	100–121	108·32	7·3315	1·5631	105	t=0·47*	95	t=1·78*
Bi-zygomatic breadth ..	22	125–149	137·82	6·3594	1·3558	145	t=1·10*	130	t=1·20*
Bi-gonial breadth	22	75–116	98·59	9·3943	2·0029	100	t=0·13*	88	t=1·10*
Interorbital breadth ..	22	92–116	102·36	6·3060	1·3445	97	t=0·83*	89	t=2·07*
Transorbital breadth ..	22	21–35	29·05	3·6447	0·7770	24	t=1·36*	30	t=0·25*
Total face height	22	172–215	196·59	10·3816	2·2134	198	t=0·13*	187	t=0·90*
Upper face height	22	130–194	160·77	13·4304	2·8634	167	t=0·45*	143	t=1·29*
Nose height ..	22	40–60	48·91	5·5713	1·1879	57	t=1·42*	44	t=0·86*
Nose breadth ..	22	40–57	49·95	5·3406	1·1386	46	t=0·72*	46	t=0·72*
Nasal tip breadth	22	11–26	18·95	4·8939	1·0434	21	t=0·41*	21	t=0·41*
Nasal depth ..	22	27–40	32·41	3·8255	0·8156	29	t=0·87*	31	t=0·36*

* Non-significant difference. † Significant difference.

Under the circumstances it is probably best to recognize the fact that the aborigines do show a wide range of head heights and that there may have been a preponderance of the lower figures in South Australia.

The range of length-height indices for the females is also more compact than in the male and falls within the male range, but the means for the two sexes are remarkably close (68·81, 68·28; Tables X and XII). The mean length-height index here is slightly higher than the mean given by Campbell, Gray and Hackett (1936) for combined Central and South Australians. But it is also higher than that given by Warner (Howells) for either north-east or north-west Arnhem Land and comes very close to Burston's 69·98 for the Darwin district.

Under the circumstances, it looks as though too much has been made of the possible differential significance (within Australia, at least) of this measurement. On general standards (see Martin, S. 798) some of these aborigines run well up into the hypsicephalic range.

Head Breadth. The minimal frontal diameter in the adult males ranged from 100 to 121 mm., with a mean of 108·32 mm.; in the adult females the range was 93 to 113 mm. and the mean 103·25 mm. (Tables IX and XI). These figures are fairly typical for aboriginal groups, although Burston's measurements on the natives

TABLE X.

Adult Males: Statistical Analysis of Indices.

Index.	*n* Number Observed.	Range.	*x* Mean.	S.D. Standard Deviation.	S.D. *x* Standard Error of Mean.	Njalia × Jumu / One Observation		Pintubi / One Observation	
Weight-stature	22	2636–4278	3345·82	409·6256	87·3325	3003	t=0·82*	2626	t=1·72*
Radio-humeral	22	78·8–94·6	84·51	4·3875	0·9354	81·0	t=0·78*	82·1	t=0·54*
Tibio-femoral	22	76·9–96·9	88·00	6·2585	1·3343	90·7	t=0·42*	80·4	t=1·19*
Intermembral II[1]	22	59·2–73·1	66·25	3·4543	0·7365	65·6	t=0·18*	60·1	t=1·77*
Hand	22	31·9–53·6	44·15	4·8420	1·0323	45·7	t=0·31*	37·5	t=1·34*
Palmar	21	63·5–128·4	88·51	15·8782	3·4649	89·6	t=0·07*	75·0	t=0·83*
Relative shoulder breadth	22	17·7–22·5	20·30	1·0699	0·2281	19·9	t=0·37*	21·5	t=1·10*
Relative sitting height A[2]	22	40·8–49·3	46·13	2·1319	0·4545	47·8	t=0·77*	48·1	t=0·90*
Cephalic	22	67·4–82·9	73·32	3·6467	0·7775	76·3	t=0·80*	79·4	t=1·63*
Cranial module	21	434–479	460·67	11·4470	2·5596	462	t=0·11*	420	t=3·47†
Cephalic length-height	21	59·0–80·6	68·28	4·3667	0·9965	66·8	t=0·32*	67·6	t=0·15*
Cephalic breadth-height	21	79·3–100·8	92·84	5·6428	1·2314	87·6	t=0·91*	85·2	t=1·32*
Fronto-parietal	22	69·0–89·8	77·41	5·9711	1·2731	72·4	t=0·82*	70·4	t=1·15*
Cephalo-facial	22	89·3–110·2	98·50	5·7467	1·2252	100·0	t=0·26*	96·3	t=0·37*
Zygo-frontal	22	71·4–89·5	78·72	5·5380	1·1807	72·4	t=1·12*	73·1	t=0·99*
Zygo-gonial	22	55·6–80·8	71·59	6·3812	1·3605	69·0	t=0·40*	67·7	t=0·60*
Fronto-gonial	22	75·0–110·5	91·21	8·6137	1·8365	95·2	t=0·45*	92·6	t=0·16*
Facial	22	127·4–156·0	142·78	7·4438	1·5870	136·6	t=0·81*	143·8	t=0·13*
Upper facial	22	106·2–136·6	116·93	7·4749	1·5936	115·2	t=0·23*	110·0	t=0·91*
Nasal A[3]	22	80·4–137·5	99·53	14·8738	3·1711	90·2	t=0·61*	104·6	t=0·33*
Nasal B[4]	22	49·1–82·2	66·32	8·2943	1·7684	63·0	t=0·39*	67·4	t=0·13*
Tip-alar	22	21·4–58·1	38·95	11·6052	2·4742	45·7	t=0·57*	45·6	t=0·56*

* Non-significant difference. † Significant difference.

[1] $\frac{\text{Humerus}+\text{radius}}{\text{Femur}+\text{tibia}} \times 100$

[2] $\frac{\text{Sitting height (vert.)}}{\text{Stature}} \times 100$

[3] $\frac{\text{Nose breadth}}{\text{Nose height}} \times 100$

[4] $\frac{\text{Nose depth}}{\text{Nose breadth}} \times 100$

in the Darwin area gave the much higher mean of 112·30 mm. (see Howells for comparative figures). The fact that no child—even so young as 3 weeks of age—gave a measurement of less than 90 mm. (Tables III and IV) indicates that this region is one which does not expand very much after birth. A small minimal frontal diameter is considered pretty characteristic for aborigines, but comparison with Martin's series (S. 818) indicates that the Australians are not exceptional in this respect.

So far as maximum skull breadth goes, the mean figures for adult males and females compare fairly with those given by Burston (1913), but are slightly higher

than those for further north (Howells, 1937) and slightly lower than those for further south (Campbell, Gray and Hackett, 1936). It is difficult to attach any significance to these differences.

The transverse fronto-parietal index—calculated from the means—is 77·4 for males and 76·5 for females. These indices disclose a smaller disparity between minimum and maximum head breadths than in most groups (Martin's table, S. 820, is for skulls only).

As can be seen from the zygo-frontal indices (male 78·72, female 80·23, Tables X and XII) both sexes are markedly phaenozygous, but the male more so. A glance at corresponding figures for juveniles (Tables VII and VIII) indicates that the difference

TABLE XI.

Adult Females: Statistical Analysis of Data.

Character.	*n* Number Observed.	Range.	$\bar{x}$ Mean.	S.D. Standard Deviation.	S.D. $\bar{x}$ Standard Error of Mean.
Weight	20	37·7–59·5	45·43	5·8295	1·3035
Stature	20	1493–1662	1571·00	48·2166	10·7816
Sitting height	20	675–783	732·25	30·1468	6·7410
Bi-acromial breadth	20	288–343	310·90	16·2963	3·6440
Bi-iliac breadth	20	165–275	246·15	24·0597	5·3799
Chest breadth	20	200–250	221·90	13·3610	2·9876
Chest depth	20	150–220	177·85	18·5952	4·1582
Humeral length	20	256–320	292·30	15·9773	3·5726
Radial length	20	220–265	241·20	11·7679	2·6314
Hand length	20	170–192	179·90	7·4615	1·6684
Hand breadth	20	67–84	78·00	4·5998	1·0285
Index finger length	20	76–92	82·25	3·8781	0·8672
Femoral length	20	380–476	424·35	25·6480	5·7351
Tibial length	20	349–425	380·75	20·8349	4·6588
Head circumference	20	505–575	535·25	16·5653	3·7041
Head length	20	170–200	183·65	9·6860	2·1659
Head breadth	20	128–145	135·35	4·7270	1·0570
Head height	20	115–134	126·10	5·2204	1·1673
Post-auricular breadth	20	120–132	125·75	4·3392	0·9703
Minimum frontal breadth	20	93–113	103·25	5·3693	1·2006
Bi-zygomatic breadth	20	120–138	128·80	4·8731	1·0897
Bi-gonial breadth	20	78–97	87·75	5·1080	1·1422
Interorbital breadth	20	94–110	102·30	4·6578	1·0415
Transorbital breadth	20	19–27	23·40	2·1126	0·4724
Total face height	20	150–178	163·70	6·4326	1·4384
Upper face height	20	121–149	133·80	7·3671	1·6473
Nose height	20	41–57	46·75	3·4774	0·7776
Nose breadth	20	38–48	42·80	2·7453	0·6139
Nasal tip breadth	20	20–25	22·00	1·4142	0·3162
Nasal depth	20	20–31	26·30	2·7739	0·6203

between the two measurements increases fairly progressively with increasing age, as Campbell, Gray and Hackett found also. The figures for aborigines, incidentally, come fairly high in the general scale (Martin, S. 908).

Face. "Total face height" here is the "physiognomic" face height—i.e. from trichion to gnathion. This is probably not the most satisfactory measurement since the hairline of necessity varies and male aborigines commonly pluck the frontal hair. The "morphological face height"—nasion to gnathion—is almost certainly a sounder measurement, but even this is not always easy to measure, particularly in aborigines, where the nasion is usually far removed from the most obvious maximum nasal depression (Abbie and Adey, 1955).

The physiognomic total face height for adult males ranged from 172 to 215 mm., with a mean of 196·59 mm.; for adult females the range was 150 to 178 mm. and the mean 163·7 mm. (Tables IX and XI). The corresponding figures given by Campbell, Gray and Hackett for central Australian aborigines are rather less for males but about the same for females. The measurement for adult males is higher than any given by Martin (S. 897) but the female figure is comparatively low. Calculated from the means, the upper face height in the male is 81·7% of the total face height and in the female 81·5%. These figures are remarkably close and emphasize, further, that only a relatively small proportion of the facial height (less than 19%) is given to the lower jaw.

TABLE XII.

Adult Females: Statistical Analysis of Indices.

Index.	*n* Number Observed.	Range.	*x* Mean.	S.D. Standard Deviation.	S.D. *x* Standard Error of Mean.
Weight-stature	20	2426–3909	2891·65	394·8659	88·2947
Radio-humeral	20	71·9– 91·1	82·75	4·1344	0·9245
Tibio-femoral	20	77·4– 99·5	89·82	5·9279	1·3255
Intermembral II[1]	20	59·5– 71·7	66·33	2·8963	0·6476
Hand	20	36·7– 48·8	43·42	2·8925	0·6468
Palmar	20	65·7– 89·1	80·03	5·7968	1·2962
Relative shoulder breadth	20	17·7– 21·9	19·89	1·1521	0·2576
Relative sitting height A[2]	20	43·4– 49·1	46·64	1·5702	0·3511
Cephalic	20	68·4– 82·4	73·89	4·4842	1·0027
Cranial module	20	425–469	445·10	13·6956	3·0624
Cephalic length-height	20	63·1– 76·7	68·81	3·8932	0·8705
Cephalic breadth-height	20	82·1–103·1	93·27	5·0211	1·1228
Fronto-parietal	20	70·0– 86·9	76·34	4·0786	0·9120
Cephalo-facial	20	85·7–103·9	95·26	4·0549	0·9067
Zygo-frontal	20	73·2– 91·7	80·23	4·3849	0·9805
Zygo-gonial	20	61·5– 74·8	68·22	3·0832	0·8907
Fronto-gonial	20	74·3– 97·9	84·99	5·9178	1·3233
Facial	20	117·5–139·2	127·26	6·7125	1·5010
Upper facial	20	96·6–119·2	104·71	6·2028	1·3870
Nasal A[3]	20	75·5–106·8	91·89	7·4373	1·6630
Nasal B[4]	20	46·5– 73·8	61·38	7·1145	1·5909
Tip-alar	20	45·6– 57·5	51·75	3·2974	0·7373

[1] $\frac{\text{Humerus+radius}}{\text{Femur+tibia}} \times 100.$

[2] $\frac{\text{Sitting height (vert.)}}{\text{Stature}} \times 100.$

[3] $\frac{\text{Nose breadth}}{\text{Nose height}} \times 100.$

[4] $\frac{\text{Nose depth}}{\text{Nose breadth}} \times 100.$

The physiognomic facial index gives a wide range of 129·4 to 156·0 for males and 117·5 to 139·2 for females (Tables X and XII). The means—142·78 and 127·26 respectively—show an excess for males but not for females over the figures obtained from central Australia.

Nose. The nasal breadth index ("Nasal A," Tables X and XII) for adult males showed a very wide range, from 80·4 to 137·5 in adult males and from 75·5 to 106·8 in females. However, the means for both sexes—99·53 and 91·89 respectively—disclose that overall the noses are decidedly broad. These figures conform fairly closely to those given by Howells and by Campbell, Gray and Hackett.

The nasal elevation index ("Nasal B") also shows a wide range of variation in both sexes (Tables X and XII), with means for adult males of 66·32 and for females

of 61·38. These figures are much higher than those given by Campbell, Gray and Hackett (1936, p. 134). It is certain that the nasal prominence does not differ to this extent in groups which are not really widely separated, and it must be assumed that a variation in technique is responsible for the discrepancy.

Jaw. The sole jaw measurement recorded in this series is the bigonial breadth (Tables I–IV). As with most of these measurements, the range is wide in both sexes. The zygo-gonial index for adult males gives a mean of 71·59 and for the females 68·22 (Tables X and XII). Both figures are lower than those given by Howells and by Campbell, Gray and Hackett. For the skull alone Martin (S. 908) gives higher figures for both sexes, but these are hardly comparable.

The zygo-frontal index for males gives a mean of 78·72 and for females 80·23 (Tables X and XII). Howells gives a lower mean for males but about the same for females. Campbell, Gray and Hackett give lower means for both adult males and females. For the skull (Martin, S. 908) found slightly lower means for males but higher for females. All these figures are, however, of the same order.

The observations by Campbell, Gray and Hackett on juveniles, and those recorded here (Tables VII and VIII) reveal a progressive drop with age in the zygo-frontal index, disclosing that the zygomatic arch increases in breadth more rapidly than does the frontal region. At the same time, however, the zygo-gonial index remains much steadier throughout the growing period, suggesting—as might be expected—that there is a correlation between jaw size and the development of the zygomatic arch. Nevertheless, the Australian aborigine is relatively modest in this index as compared with some peoples (cf. Martin, S. 908) and his mandibular width is far from extreme. The bizygomatic diameter, on the other hand, stands relatively high in a comparative series (Martin, S. 898). Evidently, then, jaw size is not the sole factor determining the prominence of the zygomatic arches.

Discussion

In stature these aborigines fall between those of further south and those of further north. There may be a north-westerly cline of increasing stature, but more information from the north-west of the continent is needed to be sure of this. However, while male mean statures—sometimes based upon small numbers—may present a fairly orderly picture it is necessary to remember that the range from which the means are derived is often very wide. At Darwin Burston's range was 1555 to 1876 mm., Warner found a range of 1520 to 1780 mm. at Roper River, and Macintosh (1952) 1511 to 1822 mm. in south-west Arnhem Land. The maximum range of all these figures is 1511 to 1876 mm., i.e. from just over 5 feet to some 6 feet 3 inches. It is evident that the addition of a few more measurements on either side of the means could affect these quite materially. As Macintosh points out, the mean stature for any region does not necessarily give an accurate picture of the condition of a people who may show every intervening grade—he illustrates that point by some very instructive photographs. Incidentally, his lowest figure of 1511 mm.—obtained,

be it noted, in the north, not the east or south—should engender caution over acceptance of accounts of pygmoid groups of aborigines.

So far as can be ascertained, the inferior extremities of the aborigines contribute more than in any other people to the total stature.—And of the inferior extremities the distal segment (i.e. knee to ankle) in turn contributes a larger proportion than is usually found. This has long been recognized for Australian aborigines (e.g. Stirling, 1896); it characterizes both sexes and becomes apparent from about the sixth year on. The female falls slightly behind the male in the proportion of the total inferior extremity but is relatively ahead of him in the proportion of the distal segment. The females, indeed, present proportions which in European women would be considered pathognomic of "eunuchoidism." It may confidently be asserted, however, that the aboriginal women as a whole suffer no gonadal deficiency, so their physical distinction is probably of genetic origin.

In contrast to the inferior extremities, the total superior extremities in both sexes fall within the European range in relation to stature. Nevertheless, again the distal segment (elbow to wrist) is exaggerated, occupying a higher proportion of the total limb length than is usual in Europeans.

So far as can be determined from the figures from juveniles the general growth pattern follows in general that for European children, but at least some of the distinctively aboriginal physical characters appear relatively early.

The general linearity of form imposed by the length of the inferior extremities is emphasized by the relatively long face, the narrow shoulders, chest and hips, the long slender hands and feet and the prevalent overall leanness. General bodily proportions in relation to stature are strikingly similar in the two sexes. This is so surprisingly the case with the hips that an obvious line of future inquiry is correlation of female pelvic dimensions with foetal head size.

The inferior extremities reflect strongly the aboriginal leanness. Especially is this so with the leg proper for a great many—but by no means all (Abbie, 1951)—aborigines are decidedly "spindle-shanked." The reason for this has been the subject of discussion from time to time. Clearly exercise is not implicated since the aborigines are particularly active in walking, running and climbing, and there is no noticeable distinction between those of mountainous as compared with those of flat habitats. Thin calves do appear to be associated particularly with long legs and frequently with platycnemia, as is apparent in some other peoples, e.g. negroes. Platycnemia can be absolved, since it is probably due to a nutritional factor (Buxton, 1938), but the association with leg length may be considered further. One possibility is that length and thickness of leg are genetically determined together. The other is, that the greater longitudinal area available for origin of calf muscles, and/or the greater leverage afforded by the longer foot, meet their owner's mechanical needs without the development of bulging muscles. This view does not seem to have been advanced previously.

The head, taken overall, differs in no wise from that described in previous accounts. The mean cephalic index discloses a predominance of dolichocephaly

in both sexes. There is, indeed, little sexual difference, but this is not unusual in whole head as opposed to purely cranial estimations and is fairly attributable to the greater lateral thickness of soft tissues in the male. But while dolichocephaly predominates it would be wrong to ignore the fact that the range is very wide and that some members of both sexes are genuinely brachycephalic. And this, it may be observed, is in a region far removed from the traditional site of any putative "Tasmanoid" influence.

A low figure for head height has been considered distinctive of more southern aborigines. All that can be said here is that the range of head heights found so far north embraced practically the lowest recorded for South Australia. Any ethnological distinction postulated on this character must, then, be treated with reserve.

The aborigine is relatively long in the face—a fact which is sometimes obscured by the width of the zygomatic arches and the breadth of nose and mouth, together with a greater or less degree of prognathism. Considering the size of the teeth and the dimensions of the dental arches, however, the degree of prognathism is not excessive, while the mandible is usually less massive as a whole than that from a comparable European skull. In these aborigines alveolar prognathism is more marked than facial prognathism (Abbie and Adey, 1955) and it has been suggested that this is caused by the necessity for accommodating relatively big dental crowns on a relatively restricted dental arch (Abbie, 1952). However this may be, the bigonial diameter in these aborigines is not remarkable in comparison with some other peoples. In both sexes, too, the lower part of the face is relatively small. The relationship of the bigonial diameter to the bizygomatic diameter, although the two keep step more or less throughout life, is also comparatively modest. The bizygomatic diameter, however, is both relatively and absolutely large, and appears to represent more than just an expression of jaw size.

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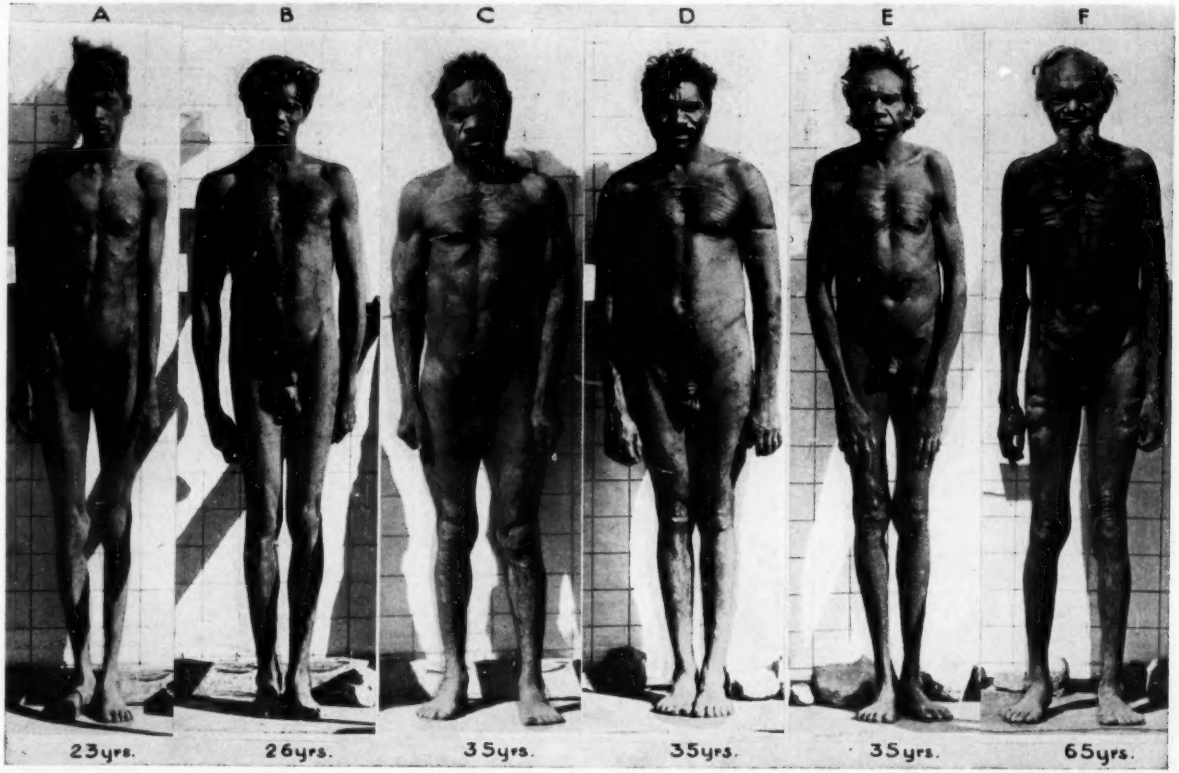
SUMMARY

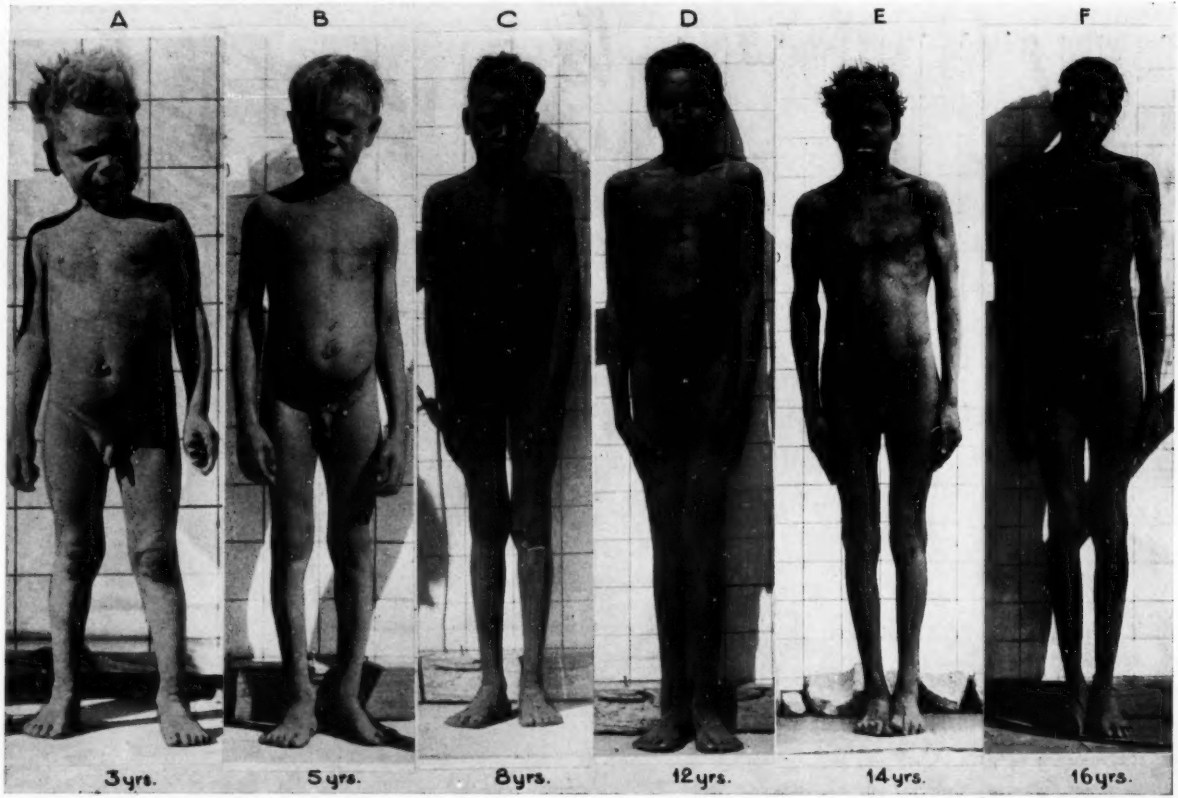
1. There is an account of the biometrical characters of 106 Central Australian aborigines, mostly of the Njalia (Walpari) tribe.

2. A number of these characters are discussed on a comparative basis.

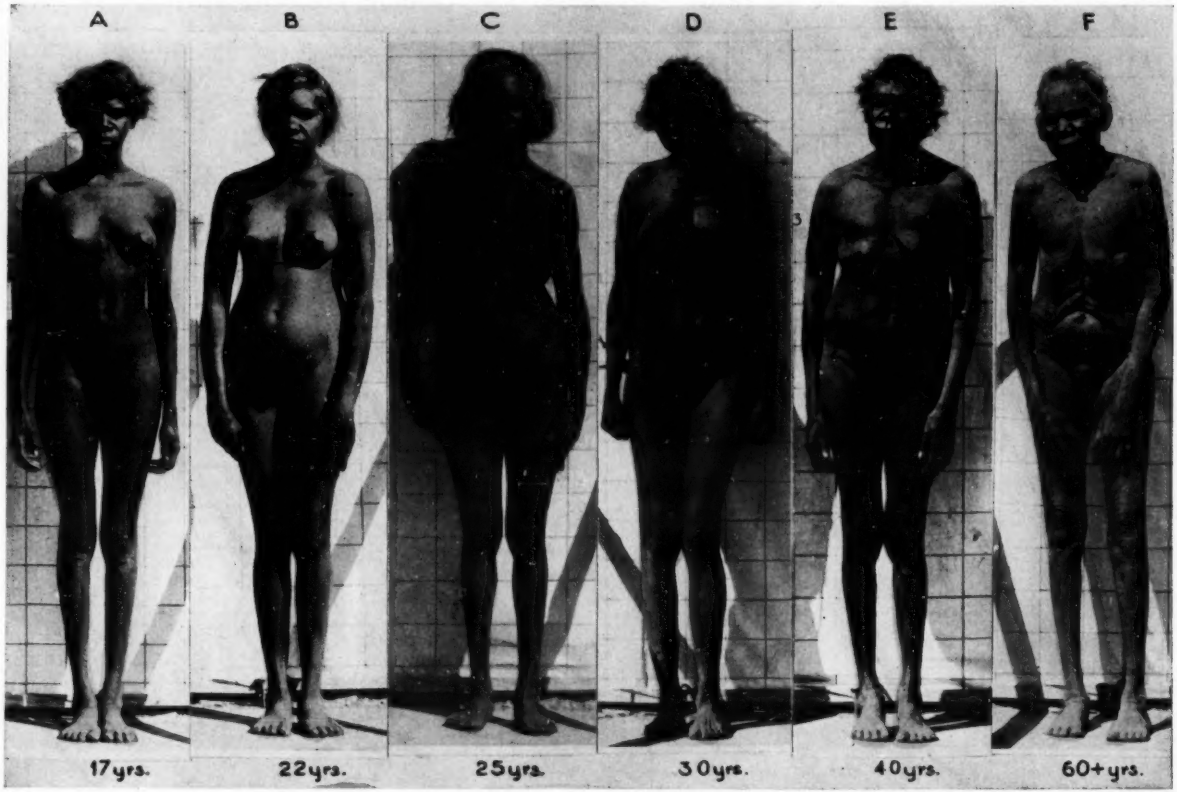


Adult Njalia males. A, B, E and F are fairly "typical" of this group. C has a definitely "achondroplasiac" appearance—cf. relative proportions of trunk and inferior extremities. D is unusually robust.
Orthogonal photographs taken against a 10 *cm. squared screen from which proportions can be roughly estimated by inspection.*

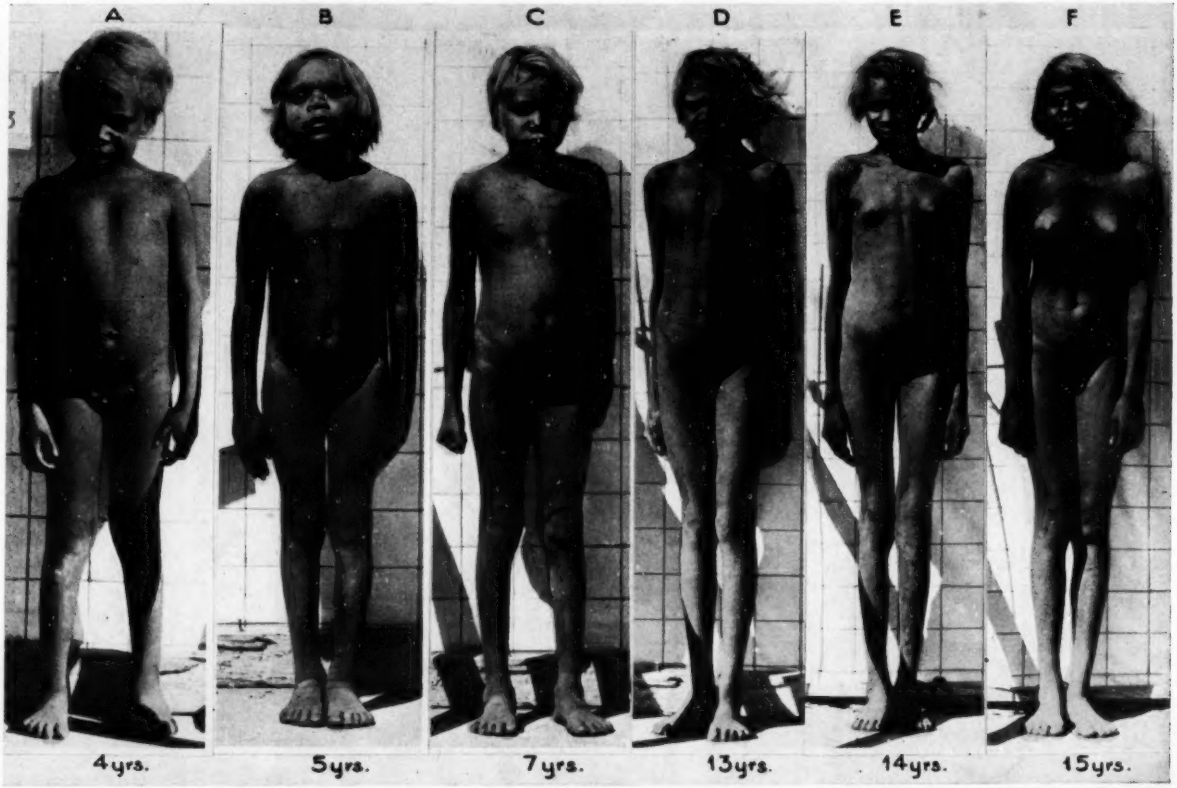
A
B
C
D
E
F



Juvenile males in progressive age order. Note (a) *change in relative proportions of trunk and inferior extremities from B to C,* (b) *early darkening of scalp hair. E was physically precocious.*
Orthogonal photographs taken against a 10 *cm. squared screen from which proportions can be roughly estimated by inspection*



Adult females. B was pregnant, D might have been.
Orthogonal photographs taken against a 10 *cm. squared screen from which proportions can be roughly estimated by inspection.*



Juvenile females in age order. Again, relative proportions change between B and C. In the girls fair-headedness persists. Orthogonal photographs taken against a 10 *cm. squared screen from which proportions can be roughly estimated by inspection.*

3. Some of the characters more distinctive of aborigines appear quite early in the growing period.

4. The full list of measurements obtained and indices extracted is published herewith.

References

Abbie, A. A., 1947. "Headform and Human Evolution," *J. Anat. Lond.*, Vol. 81, pp. 233–258.

Abbie, A. A., 1951. "The Australian Aborigine," *Oceania*, Vol. XXII, pp. 91–100.

Abbie, A. A., 1952. "A New Approach to the Problem of Human Evolution," *Trans. Roy. Soc. S. Aust.*, Vol. 75, pp. 70–88.

Abbie, A. A., and Adey, W. R., 1953*a*. "Pigmentation in a Central Australian Tribe with Special Reference to Fair-headedness," *Am. J. Phys. Anthrop.*, (n.s.) Vol. 11, pp. 339–360.

Abbie, A. A., and Adey, W. R., 1953*b*. "Ossification in a Central Australian Tribe," *Human Biology*, Vol. 25, pp. 265–278.

Abbie, A. A., and Adey, W. R., 1955. "The Non-Metrical Characters of a Central Australian Tribe," *Oceania*, Vol. XXV, pp. 198–207.

Barrett, M. J., 1953. "Dental Observations on Australian Aborigines: Yuendumu, Central Australia," *Aust. J. Dent.*, Vol. 57, pp. 127–138.

Billington, P. B., N.D. "The Health and Nutritional Status of the Natives" [of Arnhem Land]. *Report of the Nutrition Unit, National Geographic Society—Australian Department of Information Joint Expedition to Arnhem Land*, 1948. (In press.)

Boas, F., 1940. *Race, Language and Culture*. New York: Macmillan.

Burston, R. S., 1913. "Records of the Anthropometric Measurements of 102 Australian Aboriginals", *Bull. N. Aust.*, 7A.

Buxton, L. H. D., 1938. "Platymeria and Platycnemia," *J. Anat. Lond.*, Vol. LXXIII, pp. 31–36.

Campbell, T. D., and Barrett, M. J. "Dental Observations on Australian Aborigines: Changing Environment and Food Pattern," *Aust. J. Dent.*, Vol. 57, pp. 1–6.

Campbell, T. D., Gray, J. H., and Hackett, C. J., 1936. "Physical Anthropology of the Aborigines of Central Australia", *Oceania*, pp. 106–139 and 246–261.

Campbell, T. D., and Lewis, A. J., 1926. "The Aborigines of South Australia: Anthropometric, Descriptive and Other Observations Recorded at Ooldea," *Trans. Roy. Soc. S. Aust.*, Vol. 51, pp. 65–75.

Howells, W. W., 1937, "Anthropometry of the Natives of Arnhem Land and the Australian Race Problem," *Pap. Peabody Mus. Harv, Univ.*, Vol. 16, pp. 1–97.

Macintosh, N. W. G., 1952. "Stature in Some Aboriginal Tribes in Southwest Arnhem Land," *Oceania*, Vol. XXII, pp. 208–215.

Martin, R., 1928. *Lehrbuch der Anthropologie*, 2te. Auf, Jena, Fischer.

Simmons, R. T., Graydon, J. J., and Semple, N. M., 1954. "A Blood Group Genetical Survey in Australian Aborigines," *Amer. J. Phys. Anthrop.*, (n.s.) Vol. 12, pp. 599–606.

Spencer, B., and Gillen, F. J., 1899. *The Native Tribes of Central Australia*, London: Macmillan.

Spencer, B., and Gillen, F. J., 1904. *The Northern Tribes of Central Australia*, London: Macmillan.

Stirling, E. C., 1896. *Report on the Work of the Horn Scientific Expedition to Crntral Australia. Part IV. Anthropology*, London, Dulau, and Melbourne, Melville, Mullen and Slade.

A. A. Abbie.

REVIEWS

A Dictionary of the Nggela Language (Florida, British Solomon Islands). By C. E. Fox. Unity Press, Auckland, N.Z., 1955. Pp. 271. £N.Z.1/5/–.

It is good to have an addition to the dictionaries of Melanesian languages of the Solomon Islands, and especially from the pen of so tried and skilled an authority as the Rev. Dr. Fox. Already known for his anthropological work *The Threshhold of the Pacific*, he has over a period of many years familiarized himself with a number of the languages of this area, of which Nggela is one. Dr. Fox has had many disappointments in regard to the printing of his material, both through war and other causes.

The present dictionary is Nggela-English only. It is rather a pity that it does not contain an English-Nggela index as in the case of Ivens' Sa'a-Ulawa Dictionary and his Bugotu Dictionary. At present there is nothing more to provide an English-Nggela vocabulary than Fox's little *Nggela for Beginners*. As this was published by the Melanesian Mission Press in the Solomons in 1941, very few people will have it at the present day. The present dictionary contains at a rough count about 10,000 words, which represent, however, both bases and derivatives. Of the latter, there are considerable numbers: compounds of *mbosa* take a whole page to themselves. The distinction of various meanings attachable to one word is made clear by numbering and alignment, and the number of words which have more than one meaning is quite large. Some of these variant meanings are quite interesting from the linguistic point of view as transfers or metaphorical uses, and there are cases in which the linguist might be inclined to reverse Fox's order, e.g., *hogohalavu* "1. a foster brother. 2. to transfer from one bag to another." It would seem to be better to regard the verbal meaning as primary and a foster brother as one who is transferred from one family to another. In other cases again, the distinctions in meaning indicated by different numbers seem to be hardly necessary, e.g., *mamala* "1. light, opposite *mava*, 'heavy.' 2. unimportant." Many points of interest might be picked out concerning derived meanings—but this of course is true of any well-prepared dictionary. On the other hand, it is usual in modern dictionaries to enter root morphemes and place compounds under the simple root. Fox, however, enters the reciprocal prefix *vei-* and gives a whole page of derivatives under that heading, in the older style of lexicology.

The work was published by the Auckland Institute of New Zealand in conjunction with the Melanesian Trust Board, the South Pacific Commission and the Polynesian Society. This made it impossible for him to do the proof-reading himself, and many of the errors might have been avoided if he had been able to. This he regrets in his preface. The system of spelling adopted is unfortunate, and springs entirely from the Polynesian Society's continued refusal to use italic letters or phonetic characters. This has meant that *ŋ* has had to be written as *ng* and *ŋg* as *ngg*, and this in turn has caused the use of *mb* for *b* and *nd* for *d*. As the plosives never occur other than nasalized, this means that words beginning with *b* in the Mission printing must be sought in a special section, *MB-*, beginning at page 104, after all the *M* plus

vowel words, and similarly with initial *d*, and with correspondingly unnecessary dislocations throughout the Dictionary. With a modern system of phonemic spelling available, these blemishes could have been avoided.

These weaknesses, however, are not to be attributed to Dr. Fox; his work is excellent and the book is certainly a " must " for all students of Melanesian languages.

A. CAPELL.

Anthropology in Administration. By H. G. Barnett. Row, Peterson and Co., Evanston and New York, 1956. Pp. 1–196. Price, $5.

Although much has been written about the relationship between Anthropology and Administration of dependent peoples, very little has come from the American side, probably because until the conclusion of World War II America did not have the problem, except amongst its own Indian groups. With the conclusion of the war, however, the former Japanese mandated islands in the northern Pacific became the United States Trust Territory of the Pacific Islands, and the Government was forced to undertake a new type of administration. Professor Barnett had unique experience there: besides being a member of the CIMA expedition, he also served as Staff Anthropologist in the Territory from 1951 to 1953. A former Deputy High Commissioner of the Territory, J. A. McConnel, says in his preface to the book, " the reader gets the rare opportunity of vicariously performing the day-to-day tasks of a field or staff anthropologist."

The problem faced in the book is: how to apply the results of anthropological research to the government of backward peoples. Of course, there is a prior question should there be such a collaborative effort of anthropologist and official at all? Some claim that the anthropologist ought not to be involved in applied science, and some administrators regard the anthropologist as an interloper in their domains. Professor Barnett takes full account of these attitudes in his second chapter, entitled " Prejudice and Principle." His first chapter, " Knowledge and Policy," reviews the history of the entire problem in a very interesting and comprehensive manner, covering practically the whole world of native administration. Of particular value is his study of the administration problem in Africa, for which he seems to have gained an almost disproportionate amount of help from the writings of Edwin Smith.

With regard to the basic problem of the anthropologist's part in government, he shows first that the results achieved by a number of different administrations, which have used the anthropologist in various capacities, has been fully justified. He lists the various relationships possible between the anthropologist and the administrator—whether the former is to be just an advisor called in from time to time to deal with specific problems (e.g., the work of Rattray on the Ashanti coast) or whether he is to be a permanent consultant attached to the Administration (e.g., the Sociological Research unit of the Tanganyika Government) or whether he is to be a government officer himself, a Government Anthropologist, as in Australian New Guinea. In general, Australia has favoured the giving of government status to an anthropologist who reports and advises on matters assigned to him for study by the Administration, and is at the same time free to pursue studies in which he is personally interested; but he does not have administrative authority. As Professor Barnett puts it, " In general, the anthropological task in New Guinea has been conceived to be one of contributing information to the solution of problems in native

education in its broadest sense. This has included much basic research on tribal life as well as investigations of disturbances due to unusual events. It has also embraced secondment to other branches of the service, as it did when the Government Anthropologist joined a medical team to collect specific data on food production and consumption patterns in five Papua-New Guinea villages."

In the American Trust Territory, however, the problem has been rather differently tackled. When the war concluded, the management of the Trust Territory was first undertaken by the American Navy, and the CIMA Expedition was organized by the Navy in conjunction with the Pacific Science Board. In 1951 the Navy relinquished control of the Trust Territory, which then became a field of civil administration. It is divided up into five areas, and even during 1950 " Anthropological Field Consultants were attached to units in Palau, Yap, Truk, Ponape and the Marshalls ; and the Staff Anthropologist was assigned to the Chief Administrator at field headquarters on Truk. During that year another anthropologist served as Internal Affairs Officer with the Truk unit, and the SIM anthropologist continued to act as advisor on Saipan. Field consultants were permitted to reserve one-third of their time for research of their choice. The rest of their time was taken up by directed duties, either of an administrative or a research character." Since then there has been some modification of the system, and the general plan now is to have an anthropologist attached to each district, and a staff anthropologist at headquarters to coordinate the work. A considerable part of the book is given to illustrations of how this system has worked out in practice. Cases are given and documents quoted covering a considerable variety of activities. Here one might feel inclined to make the only adverse comment possible on the book, viz. that the chapter on " Means and Ends " (pp. 110–170) goes into too much detail and embraces too many special instances, but perhaps this may be pardoned in a book which deals with a new field and a new type of approach.

The anthropologist in the Trust Territory is expected to learn the language of the people, and is given sufficient permanency in the one district to be able to do this and to know the people sufficiently well to be accepted and trusted by them. Perhaps this is a simpler matter in Micronesia, where languages are not so numerous as they are in New Guinea, but the principle of permanence within an area is worth imitation. The final chapter is entitled " Pros and Cons " and subdivided into sections on Integration (how the anthropologist is to fit into the Administration), Neutrality (the powers and limitations of the anthropologist regarded as a technical officer), Ethics (the social responsibility of the Anthropologist), and finally practicability. Whatever differences of opinion there may be on individual points, the reader of Professor Barnett's book will have no misgivings on this last score, and he will learn a great deal about ways in which the anthropologist may, if he will, apply his science for the well-being of the people, without thereby ceasing to be a scientist in the strictest sense of the term.

The book is well produced and bound, and only one misprint was noticed, viz. page 21, where the name of Makerere College in Uganda appears as Makerera. It would have been an advantage to bring the numerous footnotes together at the end of the book as a bibliography, as is commonly done in American and other works.

A. CAPELL.

Calendar of Philippine Documents in the Ayer Collection of the Newberry Library. Ed. by Paul S. Lietz, Loyola University. Published by The Newberry Library, Chicago. 1956. Pp. i-xvi, 1–259.

This is an excellently produced catalogue of documents (in Spanish) concerned with the Philippines from the middle of the sixteenth century to the end of the nineteenth. It is a selection from an immense mine of material and is given in chronological order. In addition to the name of the writer, the size of the document, and whether it is an original, a copy or photostat, or has been published in some collection, the Editor provides in a brief English summary the substance of each item. As a result, if one reads the Calendar through, one gathers a very useful introduction to the study of Spanish-Filipino relations through the centuries documented, and to the British incursions of the eighteenth century.

Students of culture contact and colonial administration will find the Calendar a door to much important comparative material. Thus, one document, dated about 1825, states that after 250 years only the coasts are occupied (by the Spaniards) and Christianized. Mindinao is still Moslem and largely unknown. Education lags. Indians (Filipinos) are Mongols and live comparatively well in the Philippines. Another document, 1827, points out that the army is officered in part by *mestizos*, who lack training, inspire class feeling, fraternize with Indians and are untrustworthy . . . Indian villages should be reduced to 5,000 persons to be able to handle revolts. Foreigners are the cause of scandals. None should be allowed to stay more than ten years unless he marries. A business man in 1827 advocates the sending out of new colonists, and the development of agriculture, a banking system and free trade.

This book will be welcomed both for what it provides in itself, and for the rich mine to which it leads.

A. P. Elkin.

Insects as Human Food. By F. S. Bodenheimer. Published by Dr. W. Junk. The Hague. 1951. Pp. 1–352.

The sub-title is "A Chapter of the Ecology of Man." The author, who is Professor of Zoology in the Hebrew University, Jerusalem, has made a very useful contribution to the ecological aspect of anthropological investigation, an aspect which frequently tends to be neglected by field workers. Professor Bodenheimer has limited his own enquiry to the use of insects as food. He has demonstrated from a careful examination of the relevant literature "that at certain seasons, under certain sociological and ecological conditions, insects have formed and remain an important part of the all-the-year-round food of primitive man; they do not represent a mere dainty, but a physiological necessity by virtue of their qualitative as well as quantitative importance."

The section on the nutritive value of insects is especially valuable, for it shows that peoples, when eating locusts, termites, bees and other insects, were not grasping in despair at a means of preventing starvation, but were using a food which they had found good—a finding now confirmed by science. Moreover, they liked the diet. A section on the history of entomophagy is full of interest, and the chapters on the geographical regions and their local insect foods provides the bases for generalization. Australia, Africa, Asia (including Indonesia and Japan) and the Americas are covered. The methods of gathering, preparation and consumption are described,

and in some cases associated ritual practices also. Judging from the Australian chapter, this survey is thorough.

This book can be unreservedly recommended to all who are interested in human ecology or in the history of food-habits.

A. P. ELKIN.

NOTES AND NEWS

Dr. Stephen Wurm, who held the Stephens Fellowship in the University of Sydney for two years, then a University Fellowship for six months, to enable him to carry out linguistic research, has joined the Department of Anthropology and Sociology in the Australian National University, Canberra, as Research Fellow in Linguistics.

Mr. M. J. Meggitt, Lecturer in Anthropology, University of Sydney, has returned after his second period of field work in social anthropology in Wabag Sub-District, Central Highlands of New Guinea. Professor N. W. G. Macintosh and Mr. B. Lockett, of the Department of Anatomy, University of Sydney, have also completed their second period of field research in the same region in physical anthropology. The work of all three is associated with the University of Sydney and Nuffield Foundation research project in human biology in the Central Highlands of New Guinea.

Mr. D'Arcy Ryan has been appointed by the University of Sydney to the W. M. Strong Fellowship. He plans to extend his research in the Mendi district of New Guinea, where he has already worked for two periods.

Dr. R. M. Berndt, Dr. C. H. Berndt and Miss Ruth Fink, of the University of Western Australia, have made (January to March, 1957) a preliminary study amongst the Aborigines of the Warburton Range area in Western Australia.

Mr. J. Beckett, of the Australian National University, is engaged in field research in the Aboriginal mixed-blood community at Lake Cargelligo, western New South Wales.

Mr. F. D. McCarthy, Curator of Anthropology in the Australian Museum, Sydney, was President of the Anthropology Section of A.N.Z.A.A.S. at the meeting held in January at Dunedin, New Zealand.